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QA

CLOSURE PLAN AND COST ESTIMATE FOR THREE EXISTING SUMPS LOCATED AT HONOLULU GENERATING STATION

Prepared for:

HAWAIIAN ELECTRIC COMPANY, INC.
HONOLULU, HAWAII

Prepared by:

MITTELHAUSER CORPORATION
EL TORO, CALIFORNIA

NOVEMBER, 1985

HAWAIIAN ELECTRIC COMPANY, INC. · PO BOX 2750 · HONOLULU, HI 96840-0001

GENPP 14-2 (Hon)
Closure Plan
NV/G

HEI

May 15, 1986

Revised Original

Brenner Munger, Ph.D., P.E.
Manager
Environmental Department
(808) 548-5880

Mr. William Wilson
Chief, Technical Assessment Section (T-2-22)
U. S. Environmental Protection Agency
215 Fremont Street
San Francisco, CA 94105

Dear Mr. Wilson:

Subject: Honolulu Generating Station
EPA ID#-HID000150680
Submittal of Facility Closure Plan Attachments

Enclosed are two attachments to the Honolulu Facility Closure Plan that were requested by Mr. Ray Corey of your staff. Two copies of each are provided. Please revise your copies of the Honolulu Facility Closure Plan as follows:

1. Replace Table of Contents page ii.

2. Replace Attachment D, "Financial Assurance."

3. Add Attachment E, "Basis for Not Monitoring Groundwater."

Attachment D documents that financial assurance was established for closure, while Attachment E emphasizes the negligible potential for groundwater impacts related to facility management.

We understand that if these Attachments adequately address your concerns, the closure plan can be approved. If you have any questions on the enclosed material, please call Donn Fukuda of my staff at (808)548-5674.

Two copies of this submittal will also be sent to Mr. Tom Anamizu, Chief, Noise and Radiation Branch, Hawaii State Department of Health.

Sincerely,

Brenner Munger

Encls.

cc: Tom Anamizu, DoH (w/2 encls.)
Daniel Chang, DoH (w/o encls.)

HEI

Brenner Munger, Ph.D., P.E.
Manager
Environmental Department
(808) 548-6880

March 14, 1986

Mr. William Wilson
Chief, Technical Assessment Section (T-2-22)
U.S. Environmental Protection Agency
215 Fremont Street
San Francisco, CA 94105

Dear Mr. Wilson:

Subject: Honolulu Generating Station
EPA ID# HID000150680
Revised Closure Plan for Three Existing Sumps

Enclosed are two copies of HECO's response to your February 14, 1986 Notice of Deficiency for the Honolulu facility Closure Plan. The response includes answers to specific requests for information, revised sections of the subject Plan, and two new attachments. Please revise your copies of the Honolulu facility Closure Plan as follows:

1) Replace the Table of Contents.

2) Replace Sections 1.0, 3.0, 4.0, 5.0 and 7.0.

3) Retain the original Figure 4.1 and the original Section cover sheets.

4) Insert the new Figure 6.2.

5) Replace pages A-3 and A-7.

6) Replace Attachment B.

7) Add new Attachments C and D.

Per your instructions, two copies of our response/revisions were also sent to Mr. Tom Anamizu, Hawaii State Department of Health.

If you have any questions on the enclosed material, please call Don Fukuda of my staff at (808) 548-5674.

Sincerely,

Brenner Munger

DTF/am
Enclosure (2 copies)

HAWAIIAN ELECTRIC COMPANY, INC. · PO BOX 2750 · HONOLULU, HAWAII 96840

GENPP 14-2 (Honolulu)
Closure
NV/G

Received 11/18/85

November 13, 1985

Brenner Munger, Ph.D., P.E.
Manager
Environmental Department
(808) 548-6880

Mr. William D. Wilson
Chief, Technical Assessment Section (T-2-22)
U. S. Environmental Protection Agency
215 Fremont Street
San Francisco, CA 94105

Dear Mr. Wilson:

Subject: Honolulu Generating Station
EPA ID # HID000150680
Closure Plan for Three Existing Sumps

Enclosed are two copies of the RCRA Closure Plan for subject facility. Per the instructions in your August 26, 1985 letter, two copies of the Closure Plan will be submitted to the State of Hawaii Department of Health.

Should you require additional information, please contact me.

Sincerely,

Brenner Munger

DTF:cm
Enclosures

CLOSURE PLAN, HONOLULU PLANT

RESPONSE TO EPA COMMENTS

I. CLOSURE PLAN 265.112, 265.228

1. Include the phone numbers of facility and corporate contacts.

   * Section 1.0 has been revised to include facility and corporate telephone numbers.

2. On page 1-2, the last paragraph states that "These sumps are not RCRA regulated facilities." Change this sentence to indicate that they are RCRA regulated as stated by William Wilson to you in his August 26, 1985 letter.

   * Section 1.0 has been revised to indicate that the facilities being closed are RCRA regulated.

3. Include any known information on the past history of the HECO Honolulu Generating Station including:
   - procedures, frequencies, and methods for removing sludge from the sumps
   - any instances when the wastes exceeded EP toxicity and/or corrosivity limits and
   - the freeboard height of sump #2A. Section 3.0 entitled "Hazardous Waste Management Facilities" fails to mention any weir height and the calculation of sump #2A's maximum operating capacity of 6,300 gallons also assumes no freeboard. Unless it can be demonstrated that sump #2A was operated at a level much lower than 5 feet, thereby reducing the danger of overtopping the impoundment, concrete samples will have to be taken in areas around the impoundment.

   * New sections have been added to Attachment A which discuss the sludge removal procedure for the existing system and the new system. See pages A-3 and A-7.

   * New Section 3.4 and Table 3-1 have been added to summarize waste characteristics.

   * Section 3.0 and Attachment C include an expanded description of Sump 2A (weir, overflow, area, use).

4. Clarify where, in the old treatment process, Sump #2A was used. Also explain the discrepancy between sump #2A's dimensions of 25 x 7 feet and its area of 169 square feet.

* See question number 3, above.

5. More information is necessary to determine the possibility of groundwater contamination (i.e., aquifer depth, how close the saturation zone is to the impoundments, the soil permeability, etc.)

* The Honolulu facility is not located over a useable aquifer. It is on the "Pass" side of the Pass/No Pass line, as defined by the City and County of the Honolulu Board of Water Supply. Therefore, the aquifer is defined as non-potable. According to a 1917 engineering drawing, the foundation of the building is on coral, not soil. More information will be provided if a revised closure plan is submitted because hazardous constituents are detected.

II. SAMPLING PLAN AND DECONTAMINATION 265.12, 265.114

1. Indicate what percentage of the maximum waste inventory is sludge and what percentage is liquid. (265.112(a)(2))

* See new Section 3.4.

2. Wastes in sumps must be tested for stratification in both the liquid and the solid zones. If wastes are found to be stratified, sampling must be done in each contiguous layer. This sampling may be accomplished by using a coliwasa sampler for the liquid layer and an auger for the sludge layer once the liquid layer over it has been decanted off. (See SW-846, Test Methods for Evaluating Solid Waste). If no stratification is present, grab samples may be taken.

* The Sampling and Analysis Plan, Attachment B, has been revised to include sampling of each contiguous layer, if stratification is present.

*Denotes response to EPA comments.

3. Explain what is the "equivalent" sampler to the weighted bottle that will be used to obtain the liquid grab samples.

* The term equivalent is used in the Sampling and Analysis Plan to allow for the use of alternate equipment in case of unforeseen sampling difficulties. Any equivalent method or equipment will be chosen in accordance with guidelines in EPA-SW 846.

4. Explain what is the "equivalent" to a corer or a clam sampler used to obtain the sludge samples. Since neither a "corer" nor the "clam sampler" are found in SW-846, a description of each and their operation is necessary.

* See question 3 above for explanation of equivalent. The Sampling and Analysis Plan, Attachment B, has been revised. It now specifies the use of equipment defined in EPA SW-846.

5. Detail the sampling strategy used to select the number and location (including depth of samples) of the liquid and sludge samples.

* Authoritative sampling methods rather than probability sampling methods are being used, per EPA SW-846. This choice of methods was based on the operator's knowledge of the waste streams, the homogeneous nature of the treated wastes, and the small size of each sump. Therefore two grab samples of liquid and two grab samples of sludge from each sump are considered sufficient to characterize the wastes.

6. Provide a more detailed map for each sump. Include:
   - plan and profile views of the sample locations
   - inlet and outlet piping and/or weirs
   - sludge and liquid thicknesses

* See Section 3.0 and Attachment C for engineering details of the sumps.
(Note to HECO: Drawings #25203 and 5239, sheets 1 and 2, and 50498 will comprise Attachment C)

7. Page B-1 of the closure plan states, "Prior to obtaining each sample, the sample container will be filled once with the liquid waste and emptied back into the pond." Explain your reasoning for doing this. The sample containers should be prepared in accordance with SW-846, and be fully cleaned and decontaminated prior to sampling.

   * On page B-1, the phrase in question has been eliminated since the sample bottles will be thoroughly cleaned and decontaminated by the laboratory, prior to sampling. The sampler will be rinsed with the sample, prior to obtaining each sample.

8. Even if the samples are found to be non-hazardous, the lab results from each must be submitted to the EPA for review as each step of closure is completed.

   * Section 4.0, Steps 2, 3, 4, and 8, has been revised to stipulate that all analysis results will be submitted to EPA.

9. Provide a plan for further decontamination or removal of piping if flushing is found to be inadequate for decontamination. (See Page 4-3, Step #2). Furthermore, include a sampling strategy for any waste build up or scaling that may have occurred inside the pipes that are not removed by simple flushing as proposed.

   * Step 2 in Section 4.0 has been revised to include removal of piping if it cannot be adequately flushed or if hazardous scale is present.

10. In Step 6, on Page 4-4, what specific "volumes or levels of contaminants" will be used to determine if the waste is to be treated on or off-site? If treatment is to be done off-site, where will it be carried out and how?

    * Disposal method for waste will be based on the definition of hazardous waste (40CFR261.22 and 261.24) and the facility's NPDES permit limits.

*Denotes response to EPA comments.

11. In section 5.1, "Decontamination of Equipment", what will be done with the tarp and the washwater after cleaning the equipment used in decontamination?

    * Section 5.0 has been revised to address the tarp and washwater.

12. Include the procedures and methods for decontamination of any piping or equipment used to transfer or remove any hazardous wastes from the sumps.

    * Section 5.0, Decontamination, has been revised to include piping and other equipment

13. What will determine whether decontamination residues will be treated on-site or shipped to an off-site disposal facility?

    * See Section 5.2 for disposal procedures for decontamination residues. Method of disposal will be determined by the definition of hazardous waste (40CFR261.22 and 261.24) and the facility's NDPES permit limitations.

14. Include a sample analysis request sheet in the closure plan as described in SW-846.

    * Figure 6.2 is a sample analysis request sheet.

15. Include the collector's name on the sample seals.

    * Attachment B, Sample Control, has been revised to require the sample collector's name on sample seals.

16. Submit a copy of the log book with the following information added to each sample:
    - a description of the sampling point
    - field observations
    - number and volume of samples taken
    - sample distribution and how they are to be transported

*Denotes response to EPA comments.

* Attachment B, Sampling and Analysis Plan, has been revised to include the additional requested information in the log book. A dedicated, hard-bound Field Log Book will be obtained prior to start of approval closure. The book is not yet available.

III. CLOSURE CERTIFICATION 265.115

1. Include in the certification statement that the independent professional engineer will insure that the sumps are not pitted, jointed, or cracked in a way that could allow leakage from the unit. If leakage is possible, a concrete boring and sampling plan, a groundwater detection monitoring program and a soil sampling plan must be submitted as part of a revised closure plan to determine the extent of the contamination.

* Section 4.0, Steps 8, 9, and 10, have been revised, as requested.

2. Include the approximate number or schedule of certification inspections by the independent professional engineer.

* Section 4.0, Steps 8, 9, and 10, have been revised, as requested.

IV. CLOSURE COST ESTIMATE 265.142

1. The closure cost estimate must be revised to reflect any changes in the closure plan.

* There are no revisions in the Closure Cost Estimate.

2. A more complete breakdown of the closure costs in Table 7-1 are needed, (i.e., labor costs and how many hours will be required by an independent professional engineer for closure certification and at what rate.

* Table 7-1 has been revised.

*Denotes response to EPA comments.

V. FINANCIAL ASSURANCE 265.143

1. Since the three sumps have been determined by the EPA to be RCRA regulated units, financial assurance for closure is required under 265.143.

   * HECO does not, at this time, have financial assurance for the Honolulu Plant. A copy of HECO's "financial test" for the Waiau and Kahe facilities is presented in Attachment D. The financial assurance is currently being revised to include the Honolulu Plant. The revised document will be submitted to EPA when it is available.

*Denotes response to EPA comments.

OLD C. PLAN (1985)

HECO: Honolulu
Generating Station
Closure Plan

November 1985
Rev: 0

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CLOSURE PLAN AND CLOSURE COST ESTIMATE

1.0 INTRODUCTION

This closure document has been prepared for the Hawaiian Electric Company's Honolulu Generating Station which is located in Honolulu, Hawaii. The plan is being submitted to EPA Region IX for approval before initiating closure of three concrete sumps which have handled potentially hazardous waste. The owner, facility name, address, type of industry, type of hazardous waste management unit being closed, local contact, and EPA Identification Number are presented below:

- Owner: Hawaiian Electric Company, Inc. (HECO)
- Name: Honolulu Generating Station
- Facility Address: 170 Ala Moana Blvd.
Honolulu, Hawaii 96813
- Type of Industry: Power Generation
SIC Code 4911
- Unit Closing: Three Existing Concrete Sumps
-sump #2
-sump #2A
-sump #3
- Facility Contact: Leonard DeCorte
Station Superintendent
- Corporate Address: P.O. Box 2750
Honolulu, Hawaii 96840

- Corporate Contact: Dr. Brenner Munger, Manager, Environmental Department
- EPA ID Number: HID000150680

This plan was prepared using the following as a basis: Resource Conservation and Recovery Act (RCRA) of 1976 (PL 94-580), as amended; and EPA SW-846: "Test Methods for Evaluating Solid Wastes." Copies of this plan and revisions, if any, will be kept at the following locations until closure is completed:

- Operations Superintendent's Office - on-site
- Manager of Environmental Department's Office - Corporate Office

Closure is considered complete when the closure steps in Chapter 4 have been certified complete by Hawaiian Electric Company and by an independent registered engineer and when a letter has been received from EPA agreeing that closure is complete.

This closure plan is for the closure of three sumps. These sumps are not RCRA regulated facilities. They have, in the past, stored potentially hazardous wastewater which may have had the characteristics of corrosivity or of EP Toxicity for metals content. Therefore, HECO is closing the unit in accordance with RCRA guidelines to ensure that the unit does not present a threat to human health or the environment.

Closure of the three sumps will be coordinated with construction and start-up of new treatment facilities which are exempt from RCRA permit requirements. After start-up of the new system, all hazardous or potentially hazardous wastes will be treated in above grade tanks. The tanks treating hazardous wastes will be part of a wastewater treatment unit, as defined in 40CFR260.10. Wastewater treatment units are exempt from RCRA Part B Permit requirements under the standards set forth in 40CFR270.1(c)(2)(v). Fireside and Air Heater Washwater, which is exempt from RCRA regulation per 40CFR261.4(b)(4), will also be treated solely in tanks. Although this waste is exempt from RCRA regulation, HECO recognizes that it can potentially be corrosive or have the characteristic of EP Toxicity. Therefore, the Honolulu wastewater treatment system is being modified to handle this waste in a way which will eliminate any potential threat to human health or the environment.

More detailed descriptions of the existing and proposed treatment systems are presented in Attachment A.

It is the intention of HECO to remove from the unit being closed any hazardous waste and hazardous waste contaminated residue. When closure is completed, there will be no hazardous wastes left at the facilities. Therefore, a post-closure plan is not required. After closure, the three sumps will remain in service for non-hazardous wastewater handling.

3.0 HAZARDOUS WASTE MANAGEMENT FACILITIES

Hawaiian Electric Company has prepared this Closure Plan for the following waste management unit located at the Honolulu Generating Station. The locations of the unit is shown on Figure 2-2. The unit consists of three sumps:

1. Sump #2

   - o Material of Construction: Concrete
   - o Dimensions: 25x32x10 feet
   - o Area: 800 sq.ft.
   - o Total Depth: 10 feet
   - o Weir Height: 5 feet
   - o Maximum Operating Capacity: 30,000 gallons
   - o Waste handled in the sump:

     The sump has received waste generated by operation and maintenance activities at the power plant. These wastes are potentially corrosive and EP Toxic.

2. Sump #2A

   - o Material of Construction: Concrete
   - o Dimensions (average): 25x7x5 feet
   - o Area: 169 sq.ft.
   - o Depth: 5 feet
   - o Maximum Operating Capacity: 6,300 gallons

- Waste handled in the sump:

  The sump has received waste generated by operation and maintenance activities at the power plant. These wastes are potentially corrosive and EP Toxic.

3. Sump #3

- Material of Construction: Concrete
- Dimensions: 25x37x10 feet
- Area: 925 sq.ft.
- Total Depth: 10 feet
- Weir Height: 5 feet
- Maximum Operating Capacity: 35,000 gallons
- Waste handled in the sump:

  The sump has received waste generated by operation and maintenance activities at the power plant. These wastes are potentially corrosive and EP Toxic.

3.1 MAXIMUM EXTENT OF OPERATIONS

The maximum extent of operations for this hazardous waste management unit is the total surface area of the unit. The maximum extent of operations for the sumps located at the Honolulu Generating Station is as follows:

o Sump #2	25x32 feet	800 sq.ft.
o Sump #2A	25x7 feet	169 sq.ft.
o Sump #3	25x37 feet	925 sq.ft.
o Total		1,894 sq.ft.

3.2 MAXIMUM INVENTORY

The maximum inventory of the unit is the total volume of waste contained in the sumps at maximum operating capacity. The maximum inventory of the sumps is as follows:

o Sump #2	30,000 gallons
o Sump #2A	6,300 gallons
o Sump #3	35,000 gallons
o Total	71,300 gallons

3.3 WASTE STREAMS GENERATED

There are six wastewater streams generated at the Honolulu Station. The waste streams and the approximate volumes generated are listed below:

Type of Waste stream	Maximum Volume Generated
Condenser foam cleaning waste	10,000 gal/wash
Vertan 675 (boiler tube cleaning waste)	35,000 gal/cleaning (includes rinse)
Demineralizer regeneration wastes	10,000 gpd
Boiler fireside wash	100,000 gpd (for 3 days)
Air heater wash	40,000 gal/wash
Low volume wastes (non-hazardous)	60,000 gpd

3.3.1 Boiler and Condenser Tubeside Cleaning Wastewater

Waste from cleaning boiler tube inner walls and from condensers are produced infrequently, on an average of once every four years. There are two types of metal cleaning waste: (1) acid foam cleaning waste and (2) Vertan cleaning waste. These two waste streams may be corrosive or may have the characteristic of EP Toxicity for chromium and lead. This waste is collected from direct connections from the process unit. The waste is then treated in a wastewater treatment unit and discharged in compliance with NPDES permit number HI0000027.

3.3.2 Demineralizer Regeneration Waste

Demineralizer regeneration waste is produced during daily regeneration of the demineralizer ion exchange resins. The process produces alternate acid and caustic waste streams which may have the characteristic of corrosivity. The waste is pumped to tanks where it is recirculated and, because of the alternating acid and caustic streams, is self-neutralized. The treatment tanks are part of a wastewater treatment unit.

3.3.3 Air Heater and Fireside Wash Wastewater

This waste is exempt from Federal regulation according to 40CFR261.4(b)(4). Periodic water washing of air preheaters and

boiler firesides removes fly ash, slag, and corrosion products. This waste has, in the past, been treated in the sumps which are being closed. This waste has the potential to have hazardous characteristics due to pH and metal corrosion products removed in the washing process. Therefore, HECO is upgrading its wastewater treatment system to handle this waste only in tanks.

3.3.4 Low Volume Waste

Low volume waste is primarily boiler blowdown and water from building drains. This is a non-hazardous waste. It is collected in a sump, the pH is adjusted, if necessary, and the waste is discharged in compliance with NPDES permit number HI0000027.

4.0 CLOSURE

Hawaiian Electric Company has made the decision to upgrade the current wastewater management system at the Honolulu Generating Station. After construction and start-up of new wastewater treatment facilities and closure of sumps #2, 2A, and 3, all hazardous or potentially hazardous wastes generated by the power plant will be treated in tanks to render them non-hazardous. The tanks will be part of a wastewater treatment unit which is exempt from RCRA permit requirements. The expected start-up date for the new facilities is in January of 1986. After closure, the sumps will be returned to service for handling non-hazardous wastes.

Submission of this Closure Plan for approval also constitutes notification to EPA of intent to close all Honolulu Generating Station units which have handled potentially hazardous wastes. Therefore, per 40CFR265.112(c), closure is scheduled to begin 180 days after notification of intent to close and after approval of the Closure Plan by EPA. Therefore, closure is scheduled to begin in May of 1986. Until closure begins, HECO will continue to take all steps to prevent threats to human health and the environment and will maintain current security operations.

If EPA could approve this Closure Plan and waive the 180 day notification period, closure could begin anytime after start-up of the new treatment facilities in January of 1986. HECO will notify EPA immediately if construction delays or start-up problems occur which could affect the closure date.

When the sumps have been certified closed by Hawaiian Electric Company, Inc., and by an independent registered professional engineer, and a letter is received from EPA Region IX, acknowledging that closure is complete, there will be no hazardous waste left at the sumps, and they will be returned to service for non-hazardous waste use.

Hawaiian Electric Company is basing this Closure Plan on analyses which indicate that the treated liquid and sludge contained in the sumps are not hazardous. If the results of the Sampling and Analysis Program indicate that the sumps contain hazardous waste, and the hazardous wastes and hazardous waste residues cannot be either treated or removed, this Closure Plan and closure cost estimate will be revised and resubmitted to EPA Region IX for approval.

A schedule of the following closure steps is presented in Figure 4-1.

Step 1: Notification/Submission of Closure Plan

EPA Region IX will be notified 180 days or more prior to start of closure for approval of the Closure Plan.

Step 2: Decontamination of Lines

The piping system into the three sumps which have held hazardous wastes will be flushed with plant utility water for 2 to 3 minutes. A sample of the flush water will be taken during the last 30 seconds of rinsing. The sample will be analyzed per Attachment B for pH and EP toxicity for the metals listed on Table B-1 in Attachment B. If the results indicate that the flush water is hazardous, this flushing step will be repeated until the wash water is non-hazardous.

Step 3: Sample and Analyze Liquids in the Sumps

The liquid in the sumps will be sampled and analyzed for pH and EP toxicity, per the Sampling and Analysis Plan in Attachment B, to determine if it is a hazardous waste.

Step 4: Sample and Analyze Sludge in the Sumps

The sludge in the sumps will be sampled and analyzed to determine if it is a hazardous waste, per the Sampling and Analysis Plan in Attachment B.

Step 5: Review the Results of Steps 3 and 4

If the liquid and sludge in the sumps are non-hazardous the sumps are closed for hazardous waste handling, they will continue in non-hazardous services. Go to Step 10 to complete closure activities.

If the liquid or sludge is hazardous, as defined in Table B-1 in Attachment B, Sampling and Analysis Plan, and by statistical analysis based on EPA SW-846, closure will continue with the following steps.

Step 6: Waste Removal

The liquid in the sumps (hazardous or non-hazardous) can be handled in one of two ways. The liquid waste can be treated at the on-site wastewater treatment unit and be discharged in compliance with the facility's NPDES discharge permit. If, because of volume or level of contaminants, it cannot be adequately treated on-site, it will be treated or disposed of at an approved off-site facility. Non-hazardous waste can be shipped to HECO's Kahe Generating Station for treatment. Hazardous liquids will be collected by a licensed hazardous-waste transporter for disposal at a licensed hazardous waste disposal facility. Transportation and

disposal of any hazardous waste will be tracked by a Uniform Hazardous Waste Manifest.

If the sludge in the sumps is non-hazardous, it will be removed by vacuum truck and disposed of in an environmentally acceptable manner. If the sludge is hazardous, it will be collected by a licensed hazardous waste transporter for disposal at an approved hazardous waste disposal facility. Transportation and disposal will be tracked by a Uniform Hazardous Waste Manifest.

Step 7: Decontamination of Concrete

If the sludge or liquid is hazardous, the sumps will be cleaned after removal of all waste in the sumps. The interior of each sump will be thoroughly cleaned by either hydroblasting or steam cleaning. All workers will wear protective clothing.

All washing residue will be contained in the sumps. It will then be removed and handled as a hazardous waste. It may be treated on-site at the wastewater treatment unit and discharged in compliance with the NPDES permit. Alternately, it can be collected by a licensed transporter for disposal at an approved hazardous waste

facility. Transportation and disposal will be tracked by a Uniform Hazardous Waste Manifest.

Step 8: Sample and Analyze Concrete

The concrete in the sides and bottom of each sump will be sampled and analyzed to determine if it is contaminated with hazardous constituents. The sampling and analysis will be accomplished as described in Attachment B, Sampling and Analysis Plan. The concrete will be analyzed for pH and the EP toxicity constituents on Table B-1 in Attachment B.

Step 9: Review of Concrete Analysis

If the results of the concrete analyses determine that the concrete is not hazardous, the sumps are considered closed for hazardous waste handling. The sump will continue in non-hazardous service. Step 10 will complete closure activities.

If the results of the concrete analyses indicate that the concrete is contaminated with hazardous waste constituents greater than the levels on Table B-1, closure activities will cease. The Closure Plan will be revised to allow HECO to investigate the extent of contamination and to determine the most appropriate

closure procedures. Disposal closure will be considered as an option if the sump cannot be decontaminated. The sumps are an integral part of the building structure and cannot be removed. Based on recent test results of the sump contents, this is an unlikely situation. However, if it should occur, a revised closure plan including sub-soil investigation, groundwater monitoring, and a revised cost estimate will be submitted to EPA for approval.

Step 10: Certification of Closure

When all hazardous wastes and residue have been removed from the sumps, HECO will submit a certification of closure activities to EPA Region IX. An independent professional engineer registered in Hawaii and an engineer from Hawaiian Electric Company will certify that the sumps have been closed in accordance with the approved Closure Plan.

5.0 DECONTAMINATION

5.1 DECONTAMINATION OF EQUIPMENT

The following decontamination procedures will be followed if any hazardous wastes are found.

Equipment such as samplers, trowels, and shovels used during closure will be cleaned before leaving the site. A steam cleaner or equivalent will be used to remove liquid and solid residue, since the water, sludge, or concrete is not expected to adhere strongly to the equipment. Cleaning of the equipment used at the site will take place on a waterproof tarp. The tarp will be placed on a graded area so that all liquid and residue can be contained and collected.

5.2 DECONTAMINATION RESIDUES

Decontamination residues will be treated in tanks at the on-site wastewater treatment unit and discharged in accordance with the facility's NPDES Discharge Permit number HI0000027. Alternately, the waste may be shipped to an off-site disposal facility by a licensed transporter under a Uniform Hazardous Waste Manifest.

7.0 CLOSURE COST ESTIMATE

Closure costs for the three sumps are summarized on Table 7-1. Recent analysis of the sump liquids and sludges conducted by approved test methods have demonstrated that the wastes do not exhibit the EP Toxicity or corrosivity characteristics. Therefore, this closure cost estimate summarizes the costs for sampling and analyzing liquids and sludges and treating the wastes in tanks at the on-site wastewater treatment unit and discharging the waste under NPDES permit number HI0000027.

Financial assurance is not required because the three sumps being closed are not RCRA facilities.

TABLE 7-1

SUMMARY OF CLOSURE COSTS FOR HONOLULU GENERATING STATION

Step	Description	Cost
1	Notify EPA of Closure	N/C
2	Decontaminate lines	1,000
3	Sample and analyze liquid Sampling: 8 hrs @ $100/hr Analysis: 6 samples @ $400 ea	3,200
4	Sample and analyze sludge Sampling: 16 hrs @ $100/hr Analysis: 6 samples @ $450 ea	4,300
5	Review results of steps 3,4	3,000
6	Waste removal 37 cubic yards @ $100/cu yd	3,700
7	Decontaminate concrete surface	1,500
8	Sample and analyze concrete Sampling: 16 hrs @ $100/hr Analysis: 12 samples @ $450 ea	7,000
9	Review of step 8	2,000
10	Certification of closure	3,000
-	Project management	3,000
	TOTAL ESTIMATE	31,700

during overboarding, the overboard shutoff control valve will trip closed and simultaneously the overboard pump will automatically shut down.

wastewater will be continuously recirculated within the tank for 4 hours to ensure the precipitation process is carried to completion, thus rendering it non-hazardous. The non-hazardous waste will be drained into sump No. 2 or 3 for subsequent trucking to Kahe or Waiau.

3. The existing flow meter and strainer will be relocated to allow metering of the wastewater volume which will be drained from either tank No. 5 or No. 7 into sump No. 2 or 3, or directly to the trucks.

E. Boiler Draining

After shutdown and cooling of the boiler, the boiler water will be drained into the 1500 gallon surge tank, then pumped to sump No. 1,2 or 3. Little or no treatment is required. The tank and piping must first be flushed to clear out residue from the tubeside cleaning wastewater.

F. Overboarding

The existing normal overboard Pump No. 3 will take suction from sump No. 4, pump the wastewater through the DynaSand filter for final clarification, then discharge into a clean effluent holding tank. A new overboard pump controlled by the level in the holding tank will discharge through an existing displacement meter to the Honolulu Unit 8 and 9 condenser discharge tunnel.

The existing normal overboard pump is controlled by the sump water level and a pH monitor in the sump. A high water level and normal pH reading between 6 and 9 will start the pump. A low sump level or pH readings greater than 9 or less than 6 will stop the pump.

One blank sample will be prepared on-site on each day of sampling. The blank will be distilled water transferred to a sample bottle at the site. The samples will be placed in a container and packed in ice. They will then be sent to the laboratory. The Chain of Custody procedures that are described in EPA SW-846 will be followed.

The information pertinent to sampling the liquid, sludge and concrete in the sumps will be recorded in a hard bound log book. Entries in the log book will include the following information:

- Purpose of sampling
- Location at sampling site
- Field contact
- Type of waste sampled
- Description of sampling methodology
- Date and time of collection
- Weather at time of collection
- Field measurements
- Photos, if taken
- Signature of personnel responsible for sampling

TABLE B-1

EXTRACTION PROCEDURE LIMITS AND METHODOLOGY

Constituent	Method[1]	EP Toxicity Limit Milligrams/liter (mg/l)
Arsenic	7060 or 7061	5.0
Barium	7080 or 7081	100.0
Cadmium	7130 or 7131	1.0
Chromium	7190 or 7191	5.0
Lead	7420 or 7421	5.0
Mercury	7470	0.2
Selenium	7740 or 7741	1.0
Silver	7760 or 7761	5.0
pH[2]	9040	-

The method for the Extraction Procedure is 1310 from EPA SW-846.

1. All methods are from EPA SW-846, "Test Methods for Evaluating Solid Waste".
2. pH must be greater than 2.0 and less than 12.5.

LIST OF ATTACHMENTS

LIST OF TABLES

LIST OF FIGURES

ATTACHMENT E

BASIS FOR NOT MONITORING GROUNDWATER

Hawaiian Electric Company based the decision not to monitor the groundwater at the Honolulu Power Plant closure site on several factors: one, there has been no indication that leakage has occurred; two, the waste streams treated in the sumps are only occasionally, and then only marginally, hazardous; three, the waste streams had a short residence time in the sumps before treatment rendered them nonhazardous; and, four, any leakage would have been flushed away by the tidal actions in the saline groundwater underlying the site and would be undetectable.

Routine visual inspections by plant personnel indicate that the sumps have maintained their structural integrity and are not leaking. The sumps are an integral part of the power plant foundation. They are constructed of reinforced concrete, with a wall thickness of one foot. The bottom of the sumps is located below sea level in an area which has a water table that is influenced by tidal variations, and there is no concurrent change in the liquid levels in the sumps as the groundwater level oscillates.

Any liquid which could have been released into the environment would not materially affect groundwater quality. The liquid wastes handled in the sumps were considered hazardous

wastes because of pH and metals content. Table 3-1 in Section 3 of the Closure Plan shows that the wastes seldom exceeded the Federal EP Toxicity limits for metals. After neutralization and precipitation of the waste, the liquid portion and sludge were nonhazardous. The precipitated sludge was removed after treatment and was not stored in the sumps for long periods. The Honolulu Harbor has been polluted by several of the industries in the area. The aquifer below the power plant is not a usable aquifer. Therefore, it is unlikely that the level of hazardous constituents in the wastes in the sumps would have any influence on groundwater quality in the area.

The sumps are sunk into porous coral material which is below sea level and is constantly being flushed by tidal fluctuations. Any leakage which might have occurred would be dissipated by this flushing action. This location on the edge of a deep water harbor makes development of an adequate groundwater monitoring system nearly impossible.

If, during closure, it is found that there is evidence that the sumps have not maintained their structural integrity and may have in fact leaked, EPA will be notified.

ATTACHMENT D

FINANCIAL ASSURANCE

HAWAIIAN ELECTRIC COMPANY, INC. · PO BOX 2750 · HONOLULU, HI 96840-0001

May 07, 1986

Ms. Judith E. Ayres
Regional Administrator
Environmental Protection Agency
215 Fremont Street
San Francisco, California 94105

Dear Ms. Ayres:

Enclosed is the documentation necessary for Hawaiian Electric Company (HECO) to comply with the annual EPA financial liability requirements for sudden and non-sudden accidental pollution and closure care. The financial test has been used to demonstrate liability for the $10,605,000 annual aggregate.

Provided for compliance is the following:

1) A letter from Hawaiian Electric's Chief Financial Officer and Controller, Mr. Paul Oyer, stating compliance with the liability and closure/post closure requirements enabling Hawaiian Electric Company to demonstrate financial capability.

2) A letter from Peat, Marwick, Mitchell and Company to the Board of Directors of Hawaiian Electric Company stating that the related statements evidenced in the financial test are derived from their independently audited, year-end financial statements, in accordance with generally accepted accounting principles (Exhibit A).

3) A copy of the opinion on Hawaiian Electric Company's consolidated financial statements from our independent certified accountants dated February 11, 1986 (Exhibit B).

4) A copy of Hawaiian Electric Company's consolidated financial statements as of December 31, 1985, opined on by Peat, Marwick, Mitchell, and Company (Exhibit C).

With these submittals, Hawaiian Electric Company will be in compliance with the Environmental Protection Agency's standards applicable to owners and operators of hazardous waste treatment, storage, and disposal facilities to date.

Sincerely,

Susan R. Welch

Susan R. Welch
Director, Insurance & Claims

SRW:JFM:jmm

Enclosures

cc: B. Munger - HECO
D. Fukuda - HECO

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HAWAIIAN ELECTRIC COMPANY, INC. · PO BOX 2750 · HONOLULU, HI 96840-0001

Paul A. Oyer
Financial Vice President and Controller

May 08, 1986

Letter from the Chief Financial Officer to Demonstrate Liability Coverage and Assurance of Closure Care

Ms. Judith E. Ayres
Regional Administrator
Environmental Protection Agency
215 Fremont Street
San Francisco, California 94105

Dear Ms. Ayres:

I am the Chief Financial Officer of Hawaiian Electric Company, Inc., P. O. Box 2750, Honolulu, Hawaii 96840-0001. This letter is in support of this firm's use of the financial test to demonstrate financial responsibility for liability coverage and closure and/or post closure care as specified in Subpart H of 40 CFR Parts 264 and 265.

The owner or operator indentified above owns or operates the following facilities for which liability coverage is being demonstrated through the financial test specified in Subpart H of 40 CFR Parts 264 and 265.

Facility

HIT 000 610923
Kahe Generating Station (HECO)
P. O. Box 2750
Honolulu, Hawaii 96840-0001

HIT 000 610873
Waiau Generating Station (HECO)
P. O. Box 2750
Honolulu, Hawaii 96840-0001

HID 000 150680
Honolulu Generating Station (HECO)
P. O. Box 2750
Honolulu, Hawaii 96840-0001

1) The owner or operator identified above owns or operates the following facilities for which financial assurance and closure or post closure care is demonstrated through the financial test specified in Subpart H of 40 CFR Parts 264 and 265. The current closure and/or post closure cost estimates covered by the test are shown for each facility:

Facility	1986 Closure Costs
HIT 000 610923 Kahe Generating Station (HECO) P. O. Box 2750 Honolulu, Hawaii 96840-0001	$1,400,000
HIT 000 610873 Waiau Generating Station (HECO) P. O. Box 2750 Honolulu, Hawaii 96840-0001	$1,140,000
HID 000 150680 Honolulu Generating Station (HECO) P. O. Box 2750 Honolulu, Hawaii 96840-0001	$ 65,000

2) The owner or operator identified above guarantees, through the corporate guarantee specified in Subpart H of 40 CFR Parts 264 and 265, the closure and post closure care of the following facilities owned or operated by its subsidiaries. The current cost estimates for the closure or post closure care so guaranteed are shown for each facility: None .

3) In States where EPA is not administering the financial requirements of Subpart H of 40 CFR Parts 264 or 265, this owner or operator is demonstrating financial assurance for the closure or post closure care of the following facilities through the use of a test equivalent or substantially equivalent to the financial test specified in Subpart H of 40 CFR Parts 264 and 265. The current closure and/or post closure cost estimates covered by such a test are shown for each facility: None .

4) The owner or operator identified above owns or operates the following hazardous waste management facilities for which financial assurance for closure or, if a disposal facility, post closure care is not demonstrated either to EPA or a State through the financial test or any other financial assurance mechanism specified in Subpart H of 40 CFR Parts 264 and 265 or equivalent or substantially equivalent State mechanisms. The current closure and/or post closure cost estimates not covered by such financial assurance are shown for each facility: None .

This owner or operator is required to file a Form 10K with the Securities and Exchange Commission (SEC) for the latest fiscal year.

The fiscal year of this firm ends on December 31. The figures for the following items marked with an asterisk are derived from this firm's independently audited, year-end financial statements for the latest completed fiscal year ended December 31, 1985.

PART B. Closure or Post Closure Care and Liability

ALTERNATIVE II

1.	Sum of current closure and post closure cost estimates (total of all cost estimates listed above).	$ 2,605,000
2.	Amount of annual aggregate liability coverage to be demonstrated.	$ 8,000,000
3.	Sum of lines 1 and 2.	$10,605,000
4.	Current bond rating of most recent issuance and name of rating service.	A+ Standard and Poor's Corp.
5.	Date of issuance of bond.	January 13, 1982
6.	Date of maturity of bond.	December 01, 1991

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* 7.	Tangible net worth (if any portion of the closure or post closure cost estimates is included in "total liabilities" or your financial statements you may add that portion to this line).	$251,895,000
* 8.	Total assets in the U. S. (required only if less than 90% of assets are located in the U. S.).	N/A

		YES	NO
9.	Is line 7 at least $10 million?	X	
10.	Is line 7 at least 6 times line 3?	X	
* 11.	Are at least 90% of firm's assets located in the U. S.? If not, complete line 12.	X	
12.	Is line 8 at least 6 times line 3?	N/A	

I hereby certify that the wording of this letter is identical to the wording specified in 40 CFR 264.151 (g) as such regulations were constituted on the date shown immediately above.

Paul Oyer
Financial Vice President
and Controller
May 08, 1986

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EXHIBIT A

Peat, Marwick, Mitchell & Co.
Certified Public Accountants
Financial Plaza Of The Pacific
P.O. Box 4150
Honolulu, Hawaii 96813
808-531-7286

May 8, 1986

The Board of Directors
Hawaiian Electric Company, Inc.
P. O. Box 2750
Honolulu, Hawaii 96840

Dear Sirs:

We have examined the consolidated balance sheet and consolidated statement of capitalization of Hawaiian Electric Company, Inc. and subsidiaries as of December 31, 1985 and the related consolidated statements of income, retained earnings and sources of funds for construction for the year then ended and have issued our report thereon dated February 11, 1986. Our examination was made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the aforementioned consolidated financial statements present fairly the financial position of Hawaiian Electric Company, Inc. and subsidiaries at December 31, 1985 and the results of their operations and the sources of funds for construction for the year then ended, in conformity with generally accepted accounting principles applied on a consistent basis.

The accompanying letter from the Company specifies certain data as having been derived from the aforementioned financial statements. We have (1) compared the dollar amounts of Common Stock Equity and Other Assets (Intangible Assets) at December 31, 1985 as set forth in the Company's Schedule of Tangible Net Worth to the aforementioned financial statements and found them to be in agreement and (2) recomputed the Tangible Net Worth and found it to be mathematically correct.

Nothing came to our attention as a result of the foregoing procedures that caused us to believe that the specified data should be adjusted. The foregoing procedure does not constitute an examination in accordance with generally accepted auditing standards.

Very truly yours,

Peat, Marwick, Mitchell & Co.

EXHIBIT B

Peat, Marwick, Mitchell & Co.
Certified Public Accountants
Financial Plaza Of The Pacific
P.O. Box 4150
Honolulu, Hawaii 96813

The Board of Directors and Shareholder
Hawaiian Electric Company, Inc.:

We have examined the consolidated balance sheets and consolidated statements of capitalization of Hawaiian Electric Company, Inc. (a wholly owned subsidiary of Hawaiian Electric Industries, Inc.) and subsidiaries as of December 31, 1985, 1984 and 1983 and the related consolidated statements of income and retained earnings and sources of funds for construction for the years then ended. Our examinations were made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the aforementioned consolidated financial statements present fairly the financial position of Hawaiian Electric Company, Inc. and subsidiaries at December 31, 1985, 1984 and 1983, and the results of their operations and changes in their financial position for the years then ended, in conformity with generally accepted accounting principles applied on a consistent basis.

Our examinations were made for the purpose of forming an opinion on the consolidated financial statements taken as a whole. The consolidating information is presented for purposes of additional analysis of the consolidated financial statements rather than to present the financial position, results of operations, and changes in financial position of the individual companies. The consolidating information has been subjected to the auditing procedures applied in the examinations of the consolidated financial statements and, in our opinion, is fairly stated in all material respects in relation to the consolidated financial statements taken as a whole.

Peat, Marwick, Mitchell & Co.

February 11, 1986

EXHIBIT C

HAWAIIAN ELECTRIC COMPANY, INC.
(A Wholly Owned Subsidiary of
Hawaiian Electric Industries, Inc.)
AND SUBSIDIARIES

Consolidated Financial Statements
and Consolidating Schedules

December 31, 1985, 1984 and 1983

(With Audit Report Thereon)

EXHIBIT C

HAWAIIAN ELECTRIC COMPANY, INC.
(A Wholly Owned Subsidiary of Hawaiian Electric Industries, Inc.)
AND SUBSIDIARIES

Consolidating Schedule - Financial Position

December 31, 1985

Assets	Hawaiian Electric Company, Inc.	Hawaii Electric Light Company, Inc.	Maui Electric Company, Limited	Adjustments and eliminations Dr. (Cr.)	Consolidated
Utility plant, at cost:					
Land	$ 18,228,199	2,708,018	883,756		21,819,973
Plant and equipment	761,594,991	149,631,863	123,283,636		1,034,510,490
Less accumulated depreciation	(229,818,677)	(54,395,269)	(36,303,445)		(320,517,391)
Plant acquisition adjustment	-	-	66,108		66,108
Construction in progress	9,358,040	4,765,324	1,190,851		15,314,215
Net utility plant	559,362,553	102,709,936	89,120,906		751,193,395
Investment in wholly owned subsidiaries, at equity	61,480,094	-	-	(61,480,094)(2)	-
Current assets:					
Cash	8,872,787	147,011	1,116,315		10,136,113
Temporary investments, at cost	62,357,621	1,200,778	10,280,090	(6,043,982)(1)	67,794,507
Customer accounts receivable, net	37,883,416	4,942,082	5,531,741		48,357,239
Accrued unbilled revenues, net	17,871,939	2,159,926	1,924,693		21,956,558
Other accounts receivable	4,460,094	204,149	145,399	(623,273)(1)	4,186,369
Fuel oil stock, at average cost	24,670,082	1,427,475	2,367,016		28,464,573
Materials and supplies, at average cost	5,024,165	1,123,097	3,190,310		9,337,572
Prepayments and other	1,092,313	88,718	40,469		1,221,500
Total current assets	162,232,417	11,293,236	24,596,033	(6,667,255)	191,454,431
Other assets:					
Unamortized debt expense	2,289,656	790,937	492,429		3,573,022
Long-term receivables and other	3,905,144	2,086,424	2,475,013		8,466,581
Total other assets	6,194,800	2,877,361	2,967,442		12,039,603
	$ 789,269,864	116,880,533	116,684,381	(68,147,349)	954,687,429

(Continued)

HAWAIIAN ELECTRIC COMPANY, INC.
(A Wholly Owned Subsidiary of Hawaiian Electric Industries, Inc.)
AND SUBSIDIARIES

Consolidating Schedule - Financial Position, Continued

Capitalization and Liabilities	Hawaiian Electric Company, Inc.	Hawaii Electric Light Company, Inc.	Maui Electric Company, Limited	Adjustments and eliminations Dr. (Cr.)	Consolidated
Capitalization:					
Common stock equity	$ 263,934,184	29,207,586	32,272,508	61,480,094 (2)	263,934,184
Cumulative preferred stock:					
Not subject to mandatory redemption	30,293,140	3,000,000	3,000,000		36,293,140
Subject to mandatory redemption	19,425,000	5,100,000	5,550,000		30,075,000
Long-term debt	226,008,805	35,815,856	37,980,000		299,804,661
Total capitalization	539,661,129	73,123,442	78,802,508	61,480,094	630,106,985
Current liabilities:					
Long-term debt due within one year	-	27,934	35,000		62,934
Preferred stock sinking fund requirements	1,075,000	200,000	150,000		1,425,000
Short-term borrowings	17,440,218	1,000,000	-	6,043,982 (1)	12,396,236
Accounts payable	29,116,021	2,182,153	2,362,265		33,660,439
Interest and preferred dividends payable	5,580,192	978,386	1,287,062	10,725 (1)	7,834,915
Income taxes	3,805,935	433,152	682,201		4,921,288
Other taxes accrued	10,899,347	2,928,141	3,167,991		16,995,479
Other	16,257,992	1,733,872	1,531,032	612,548 (1)	18,910,348
Total current liabilities	84,174,705	9,483,638	9,215,551	6,667,255	96,206,639
Deferred credits:					
Deferred income taxes	102,914,895	11,714,686	14,591,941		129,221,522
Unamortized investment tax credits	25,972,697	5,821,765	6,611,792		38,406,254
Other	3,650,639	4,643,179	1,232,356		9,526,174
Total deferred credits	132,538,231	22,179,630	22,436,089		177,153,950
Contributions in aid of construction	32,895,799	12,093,823	6,230,233		51,219,855
	$ 789,269,864	116,880,533	116,684,381	68,147,349	954,687,429

See accompanying auditors' report.

EXHIBIT C

HAWAIIAN ELECTRIC COMPANY, INC.
(A Wholly Owned Subsidiary of Hawaiian Electric Industries, Inc.)
AND SUBSIDIARIES

Consolidating Schedule - Income and Retained Earnings

Year ended December 31, 1985

	Hawaiian Electric Company, Inc.	Hawaii Electric Light Company, Inc.	Maui Electric Company, Limited	Adjustments and eliminations Dr. (Cr.)	Consolidated
Operating revenues	$ 497,028,122	66,247,916	72,338,055		635,614,093
Operating expenses:					
Fuel oil and purchased power	284,433,127	31,429,926	35,893,200		351,756,253
Other operation	51,927,989	8,513,508	8,980,989		69,422,486
Maintenance	15,440,305	2,734,824	3,124,887		21,300,016
Depreciation	22,677,913	5,289,448	4,200,623		32,167,984
Taxes, other than income taxes	45,312,468	6,119,341	6,651,657		58,083,466
Income taxes	29,611,394	4,523,796	4,979,363		39,114,553
	449,403,196	58,610,843	63,830,719		571,844,758
Operating income	47,624,926	7,637,073	8,507,336		63,769,335
Other income:					
Allowance for equity funds used during construction	1,176,438	186,941	55,363		1,418,742
Equity in earnings of subsidiaries	8,711,854	-	-	8,711,854 (2)	-
Other, net	4,453,355	310,082	965,283	588,532 (1)	5,140,188
	14,341,647	497,023	1,020,646	9,300,386	6,558,930
Income before interest and other charges	61,966,573	8,134,096	9,527,982	9,300,386	70,328,265
Interest and other charges:					
Interest on long-term debt	20,631,021	3,351,726	3,837,150		27,819,897
Amortization of net bond premium and expense	120,389	27,501	23,545		171,435
Other interest charges	991,599	34,254	20,018	(588,532)(1)	457,339
Allowance for borrowed funds used during construction	(358,000)	(61,090)	(19,351)		(438,441)
Preferred stock dividends of subsidiaries	-	-	-	1,736,471 (3)	1,736,471
	21,385,009	3,352,391	3,861,362	1,147,939	29,746,701
Net income	40,581,564	4,781,705	5,666,620	10,448,325	40,581,564
Preferred stock dividends of Company	4,310,590	853,403	883,068	(1,736,471)(3)	4,310,590
Net income for common stock	36,270,974	3,928,302	4,783,552	8,711,854	36,270,974
Retained earnings, beginning of year	131,261,124	13,939,740	14,904,526	28,844,266 (2)	131,261,124
	167,532,098	17,868,042	19,688,078	37,556,120	167,532,098
Dividends paid on common stock	28,570,657	3,154,055	3,470,510	6,624,565 (2)	28,570,657
Retained earnings, end of year	$ 138,961,441	14,713,987	16,217,568	30,931,555	138,961,441

See accompanying auditors' report.

EXHIBIT C

HAWAIIAN ELECTRIC COMPANY, INC.
(A Wholly Owned Subsidiary of Hawaiian Electric Industries, Inc.)
AND SUBSIDIARIES

Consolidating Schedule - Sources of Funds for Construction

Year ended December 31, 1985

	Hawaiian Electric Company, Inc.	Hawaii Electric Light Company, Inc.	Maui Electric Company, Limited	Adjustments and eliminations Dr. (Cr.)	Consolidated
Operations:					
Net income	$ 40,581,564	4,781,705	5,666,620	10,448,325	40,581,564
Equity in net income for common stock of subsidiaries	(8,711,854)	-	-	(8,711,854)	-
	31,869,710	4,781,705	5,666,620	1,736,471	40,581,564
Principal nonfund charges (credits) to income:					
Depreciation and amortization	23,179,033	5,341,651	4,342,459		32,863,143
Deferred income taxes	7,085,666	1,156,761	1,614,742		9,857,169
Investment tax credits, net	1,159,126	288,780	81,421		1,529,327
Allowance for borrowed and equity funds used during construction	(1,534,438)	(248,031)	(74,714)		(1,857,183)
	61,759,097	11,320,866	11,630,528	1,736,471	82,974,020
Less:					
Preferred stock dividends	4,310,590	853,403	883,068	(1,736,471)	4,310,590
Common stock dividends	28,570,657	3,154,055	3,470,510	(6,624,565)	28,570,657
	32,881,247	4,007,458	4,353,578	(8,361,036)	32,881,247
	28,877,850	7,313,408	7,276,950	(6,624,565)	50,092,773
Other sources (uses):					
Common stock dividends received from subsidiaries	6,624,565	-	-	6,624,565	-
Contributions in aid of construction	2,252,739	1,390,099	802,790		4,445,628
Customer advances for construction, net	296,941	(71,666)	83,431		308,706
Customer accounts receivable, net	2,652,188	375,466	837,655		3,865,309
Accrued unbilled revenues, net	1,893,608	435,812	134,866		2,464,286
Fuel oil stock	3,422,398	(23,753)	358,669		3,757,314
Accounts payable	14,895,177	425,164	424,764		15,745,105
Taxes accrued	(6,098,230)	415,998	37,821		(5,644,411)
Net change in other working capital items	(519,796)	(239,431)	(364,980)	2,213	(1,126,420)
Miscellaneous, net	(2,653,557)	(951,950)	(335,914)		(3,941,421)
	22,766,033	1,755,739	1,979,102	6,626,778	19,874,096
Carried forward	$ 51,643,883	9,069,147	9,256,052	2,213	69,966,869

(Continued)

HAWAIIAN ELECTRIC COMPANY, INC.
(A Wholly Owned Subsidiary of Hawaiian Electric Industries, Inc.)
AND SUBSIDIARIES

Consolidating Schedule - Sources of Funds
for Construction, Continued

	Hawaiian Electric Company, Inc.	Hawaii Electric Light Company, Inc.	Maui Electric Company, Limited	Adjustments and eliminations Dr. (Cr.)	Consolidated
Brought forward	$ 51,643,883	9,069,147	9,256,052	2,213	69,966,869
Financing:					
Other long-term debt	4,593,300	1,668,282	71,420		6,333,002
Short-term borrowings	7,536,095	1,000,000	-	(1,858,231)	10,394,326
Retirement of long-term debt	-	(1,055,642)	(35,000)		(1,090,642)
Retirement of preferred stock	(1,060,740)	(200,000)	(50,000)		(1,310,740)
Temporary investments	(27,670,315)	993,611	(3,580,090)	1,856,018	(32,112,812)
Capital stock expense	(94,185)	(26,018)	-		(120,203)
	(16,695,845)	2,380,233	(3,593,670)	(2,213)	(17,907,069)
Total funds from above sources	34,948,038	11,449,380	5,662,382		52,059,800
Allowance for borrowed and equity funds used during construction	1,534,438	248,031	74,714		1,857,183
Construction expenditures	$ 36,482,476	11,697,411	5,737,096	-	53,916,983

See accompanying auditors' report.

CLOSURE PLAN, HONOLULU PLANT

RESPONSE TO EPA COMMENTS

I. CLOSURE PLAN 265.112, 265.228

1. Include the phone numbers of facility and corporate contacts.

   * Section 1.0 has been revised to include facility and corporate telephone numbers.

2. On page 1-2, the last paragraph states that "These sumps are not RCRA regulated facilities." Change this sentence to indicate that they are RCRA regulated as stated by William Wilson to you in his August 26, 1985 letter.

   * Section 1.0 has been revised to indicate that the facilities being closed are RCRA regulated.

3. Include any known information on the past history of the HECO Honolulu Generating Station including:
   - procedures, frequencies, and methods for removing sludge from the sumps
   - any instances when the wastes exceeded EP toxicity and/or corrosivity limits and
   - the freeboard height of sump #2A. Section 3.0 entitled "Hazardous Waste Management Facilities" fails to mention any weir height and the calculation of sump #2A's maximum operating capacity of 6,300 gallons also assumes no freeboard. Unless it can be demonstrated that sump #2A was operated at a level much lower than 5 feet, thereby reducing the danger of overtopping the impoundment, concrete samples will have to be taken in areas around the impoundment.

   * New sections have been added to Attachment A which discuss the sludge removal procedure for the existing system and the new system. See pages A-3 and A-7.

   * New Section 3.4 and Table 3-1 have been added to summarize waste characteristics.

   * Section 3.0 and Attachment C include an expanded description of Sump 2A (weir, overflow, area, use).

4. Clarify where, in the old treatment process, Sump #2A was used. Also explain the discrepancy between sump #2A's dimensions of 25 x 7 feet and its area of 169 square feet.

   * See question number 3, above.

5. More information is necessary to determine the possibility of groundwater contamination (i.e., aquifer depth, how close the saturation zone is to the impoundments, the soil permeability, etc.)

   * The Honolulu facility is not located over a useable aquifer. It is on the "Pass" side of the Pass/No Pass line, as defined by the City and County of the Honolulu Board of Water Supply. Therefore, the aquifer is defined as non-potable. According to a 1917 engineering drawing, the foundation of the building is on coral, not soil. More information will be provided if a revised closure plan is submitted because hazardous constituents are detected.

II. SAMPLING PLAN AND DECONTAMINATION 265.12, 265.114

1. Indicate what percentage of the maximum waste inventory is sludge and what percentage is liquid. (265.112(a)(2))

   * See new Section 3.4.

2. Wastes in sumps must be tested for stratification in both the liquid and the solid zones. If wastes are found to be stratified, sampling must be done in each contiguous layer. This sampling may be accomplished by using a coliwasa sampler for the liquid layer and an auger for the sludge layer once the liquid layer over it has been decanted off. (See SW-846, Test Methods for Evaluating Solid Waste). If no stratification is present, grab samples may be taken.

   * The Sampling and Analysis Plan, Attachment B, has been revised to include sampling of each contiguous layer, if stratification is present.

*Denotes response to EPA comments.

3. Explain what is the "equivalent" sampler to the weighted bottle that will be used to obtain the liquid grab samples.

   * The term equivalent is used in the Sampling and Analysis Plan to allow for the use of alternate equipment in case of unforeseen sampling difficulties. Any equivalent method or equipment will be chosen in accordance with guidelines in EPA-SW 846.

4. Explain what is the "equivalent" to a corer or a clam sampler used to obtain the sludge samples. Since neither a "corer" nor the "clam sampler" are found in SW-846, a description of each and their operation is necessary.

   * See question 3 above for explanation of equivalent. The Sampling and Analysis Plan, Attachment B, has been revised. It now specifies the use of equipment defined in EPA SW-846.

5. Detail the sampling strategy used to select the number and location (including depth of samples) of the liquid and sludge samples.

   * Authoritative sampling methods rather than probability sampling methods are being used, per EPA SW-846. This choice of methods was based on the operator's knowledge of the waste streams, the homogeneous nature of the treated wastes, and the small size of each sump. Therefore two grab samples of liquid and two grab samples of sludge from each sump are considered sufficient to characterize the wastes.

6. Provide a more detailed map for each sump. Include:
   - plan and profile views of the sample locations
   - inlet and outlet piping and/or weirs
   - sludge and liquid thicknesses

   * See Section 3.0 and Attachment C for engineering details of the sumps.
   (Note to HECO: Drawings #25203 and 5239, sheets 1 and 2, and 50498 will comprise Attachment C)

7. Page B-1 of the closure plan states, "Prior to obtaining each sample, the sample container will be filled once with the liquid waste and emptied back into the pond." Explain your reasoning for doing this. The sample containers should be prepared in accordance with SW-846, and be fully cleaned and decontaminated prior to sampling.

   * On page B-1, the phrase in question has been eliminated since the sample bottles will be thoroughly cleaned and decontaminated by the laboratory, prior to sampling. The sampler will be rinsed with the sample, prior to obtaining each sample.

8. Even if the samples are found to be non-hazardous, the lab results from each must be submitted to the EPA for review as each step of closure is completed.

   * Section 4.0, Steps 2, 3, 4, and 8, has been revised to stipulate that all analysis results will be submitted to EPA.

9. Provide a plan for further decontamination or removal of piping if flushing is found to be inadequate for decontamination. (See Page 4-3, Step #2). Furthermore, include a sampling strategy for any waste build up or scaling that may have occurred inside the pipes that are not removed by simple flushing as proposed.

   * Step 2 in Section 4.0 has been revised to include removal of piping if it cannot be adequately flushed or if hazardous scale is present.

10. In Step 6, on Page 4-4, what specific "volumes or levels of contaminants" will be used to determine if the waste is to be treated on or off-site? If treatment is to be done off-site, where will it be carried out and how?

    * Disposal method for waste will be based on the definition of hazardous waste (40CFR261.22 and 261.24) and the facility's NPDES permit limits.

*Denotes response to EPA comments.

11. In section 5.1, "Decontamination of Equipment", what will be done with the tarp and the washwater after cleaning the equipment used in decontamination?

    * Section 5.0 has been revised to address the tarp and washwater.

12. Include the procedures and methods for decontamination of any piping or equipment used to transfer or remove any hazardous wastes from the sumps.

    * Section 5.0, Decontamination, has been revised to include piping and other equipment

13. What will determine whether decontamination residues will be treated on-site or shipped to an off-site disposal facility?

    * See Section 5.2 for disposal procedures for decontamination residues. Method of disposal will be determined by the definition of hazardous waste (40CFR261.22 and 261.24) and the facility's NDPES permit limitations.

14. Include a sample analysis request sheet in the closure plan as described in SW-846.

    * Figure 6.2 is a sample analysis request sheet.

15. Include the collector's name on the sample seals.

    * Attachment B, Sample Control, has been revised to require the sample collector's name on sample seals.

16. Submit a copy of the log book with the following information added to each sample:
    - a description of the sampling point
    - field observations
    - number and volume of samples taken
    - sample distribution and how they are to be transported

*Denotes response to EPA comments.

* Attachment B, Sampling and Analysis Plan, has been revised to include the additional requested information in the log book. A dedicated, hard-bound Field Log Book will be obtained prior to start of approval closure. The book is not yet available.

III. CLOSURE CERTIFICATION 265.115

1. Include in the certification statement that the independent professional engineer will insure that the sumps are not pitted, jointed, or cracked in a way that could allow leakage from the unit. If leakage is possible, a concrete boring and sampling plan, a groundwater detection monitoring program and a soil sampling plan must be submitted as part of a revised closure plan to determine the extent of the contamination.

* Section 4.0, Steps 8, 9, and 10, have been revised, as requested.

2. Include the approximate number or schedule of certification inspections by the independent professional engineer.

* Section 4.0, Steps 8, 9, and 10, have been revised, as requested.

IV. CLOSURE COST ESTIMATE 265.142

1. The closure cost estimate must be revised to reflect any changes in the closure plan.

* There are no revisions in the Closure Cost Estimate.

2. A more complete breakdown of the closure costs in Table 7-1 are needed, (i.e., labor costs and how many hours will be required by an independent professional engineer for closure certification and at what rate.

* Table 7-1 has been revised.

*Denotes response to EPA comments.

V. FINANCIAL ASSURANCE 265.143

1. Since the three sumps have been determined by the EPA to be RCRA regulated units, financial assurance for closure is required under 265.143.

* HECO does not, at this time, have financial assurance for the Honolulu Plant. A copy of HECO's "financial test" for the Waiau and Kahe facilities is presented in Attachment D. The financial assurance is currently being revised to include the Honolulu Plant. The revised document will be submitted to EPA when it is available.

*Denotes response to EPA comments.

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CLOSURE PLAN AND CLOSURE COST ESTIMATE

1.0 INTRODUCTION

This closure document has been prepared for the Hawaiian Electric Company's Honolulu Generating Station which is located in Honolulu, Hawaii. The plan is being submitted to EPA Region IX for approval before initiating closure of three concrete sumps which have handled potentially hazardous waste. The owner, facility name, address, type of industry, type of hazardous waste management unit being closed, local contact, and EPA Identification Number are presented below:

- Owner: Hawaiian Electric Company, Inc. (HECO)
- Name: Honolulu Generating Station
- Type of Industry: Power Generation SIC Code 4911
- Facility Address: 170 Ala Moana Blvd. Honolulu, Hawaii 96813
- Facility Telephone: 1-808-548-3538
- Facility Contact: Leonard DeCorte Station Superintendent
- Corporate Address: P.O. Box 2750 Honolulu, Hawaii 96840

- Corporate Contact: Dr. Brenner Munger, Manager, Environmental Department
- Corporate Telephone: 1-808-548-6880
- EPA ID Number: HID000150680
- Unit Closing: Three Existing Concrete Sumps
  - sump #2
  - sump #2A
  - sump #3

This plan was prepared using the following as a basis: Resource Conservation and Recovery Act (RCRA) of 1976 (PL 94-580), as amended; and EPA SW-846: "Test Methods for Evaluating Solid Wastes." Copies of this plan and revisions, if any, will be kept at the following locations until closure is completed:

- Operations Superintendent's Office - on-site
- Manager of Environmental Department's Office - Corporate Office

Closure is considered complete when the closure steps in Chapter 4 have been certified complete by Hawaiian Electric Company and by an independent registered engineer and when a letter has been received from EPA agreeing that closure is complete.

This closure plan is for the closure of three sumps. These sumps are being closed as interim status RCRA facilities. They have, in the past, stored potentially hazardous wastewater

which may have had the characteristics of corrosivity or of EP Toxicity for metals content. Therefore, HECO is closing the unit in accordance with RCRA interim status regulations guidelines to ensure that the unit does not present a threat to human health or the environment.

Closure of the three sumps will be coordinated with construction and start-up of new treatment facilities which are exempt from RCRA permit requirements. After start-up of the new system, all hazardous or potentially hazardous wastes will be treated in above grade tanks. The tanks treating hazardous wastes will be part of a wastewater treatment unit, as defined in 40CFR260.10. Wastewater treatment units are exempt from RCRA Part B Permit requirements under the standards set forth in 40CFR270.1(c)(2)(v). Fireside and Air Heater Washwater, which is exempt from RCRA regulation per 40CFR261.4(b)(4), will also be treated solely in tanks. Although this waste is exempt from RCRA regulation, HECO recognizes that it can potentially be corrosive or have the characteristic of EP Toxicity. Therefore, the Honolulu wastewater treatment system is being modified to handle this waste in a way which will eliminate any potential threat to human health or the environment.

More detailed descriptions of the existing and proposed treatment systems are presented in Attachment A.

It is the intention of HECO to remove from the unit being closed any hazardous waste and hazardous waste contaminated residue. When closure is completed, there will be no hazardous wastes left at the facilities. Therefore, a post-closure plan is not required. After closure, the three sumps will remain in service for non-hazardous wastewater handling.

3.0 HAZARDOUS WASTE MANAGEMENT FACILITIES

Hawaiian Electric Company has prepared this Closure Plan for the following waste management unit located at the Honolulu Generating Station. The locations of the unit is shown on Figure 2-2. Attachment C presents diagrams of the waste management unit. The unit consists of three sumps:

1. Sump #2

   - o Material of Construction: Concrete
   - o Dimensions: 25x32x10 feet
   - o Area: 800 sq.ft.
   - o Total Depth: 10 feet
   - o Weir Height: 5 feet
   - o Maximum Operating Capacity: 30,000 gallons
   - o Waste handled in the sump:

     The sump has received waste generated by operation and maintenance activities at the power plant. These wastes are potentially corrosive and EP Toxic.

2. Sump #2A

   - o Material of Construction: Concrete
   - o Dimensions (average): 25x7x5 feet
   - o Area: 169 sq.ft.
   - o Depth: 5 feet
   - o Maximum Operating Capacity: 6,300 gallons

- Waste handled in the sump:

  The sump has received waste generated by operation and maintenance activities at the power plant. These wastes are potentially corrosive and EP Toxic.

- Use and design of Sump #2A:

  Sump #2A was originally designed and functioned as an oil-water separator for sump #3. There is a weir between sumps #2A and #3. The wall between Sumps #2A and #3 is five feet high and has a hole in it, so the sumps operate essentially as one sump. The four walls of the combined #2, #2A and #3 sumps are each 10 feet high. The sumps operate with five feet of freeboard. As noted above, the average Sump #2A surface dimensions are 25 feet x 7 feet. The surface area of 169 sq. feet takes into account the space occupied by the weir and irregularities in the sump shape. See Attachment C for engineering details and piping diagrams.

3. Sump #3

- Material of Construction: Concrete
- Dimensions: 25x37x10 feet
- Area: 925 sq.ft.
- Total Depth: 10 feet
- Weir Height: 5 feet
- Maximum Operating Capacity: 35,000 gallons
- Waste handled in the sump:

  The sump has received waste generated by operation and maintenance activities at the power plant. These wastes are potentially corrosive and EP Toxic.

3.1 MAXIMUM EXTENT OF OPERATIONS

The maximum extent of operations for this hazardous waste management unit is the total surface area of the unit. The maximum extent of operations for the sumps located at the Honolulu Generating Station is as follows:

o Sump #2	25x32 feet	800 sq.ft.
o Sump #2A	25x7 feet	169 sq.ft.
o Sump #3	25x37 feet	925 sq.ft.
o Total		1,894 sq.ft.

3.2 MAXIMUM INVENTORY

The maximum inventory of the unit is the total volume of waste contained in the sumps at maximum operating capacity. The maximum inventory of the sumps is as follows:

o Sump #2	30,000 gallons
o Sump #2A	6,300 gallons
o Sump #3	35,000 gallons
o Total	71,300 gallons

3.3 WASTE STREAMS GENERATED

There are six wastewater streams generated at the Honolulu Station. The waste streams and the approximate volumes generated are listed below:

Type of Waste stream	Maximum Volume Generated
Condenser foam cleaning waste	10,000 gal/wash
Vertan 675 (boiler tube cleaning waste)	35,000 gal/cleaning (includes rinse)
Demineralizer regeneration wastes	10,000 gpd
Boiler fireside wash	100,000 gpd (for 3 days)
Air heater wash	40,000 gal/wash
Low volume wastes (non-hazardous)	60,000 gpd

3.3.1 Boiler and Condenser Tubeside Cleaning Wastewater

Waste from cleaning boiler tube inner walls and from condensers are produced infrequently, on an average of once every four years. There are two types of metal cleaning waste: (1) acid foam cleaning waste and (2) Vertan cleaning waste. These two waste streams may be corrosive or may have the characteristic of EP Toxicity for chromium and lead. This waste is collected from direct connections from the process unit. The waste is then treated in a wastewater treatment unit and discharged in compliance with NPDES permit number HI0000027.

3.3.2 Demineralizer Regeneration Waste

Demineralizer regeneration waste is produced during daily regeneration of the demineralizer ion exchange resins. The

process produces alternate acid and caustic waste streams which may have the characteristic of corrosivity. The waste is pumped to tanks where it is recirculated and, because of the alternating acid and caustic streams, is self-neutralized. The treatment tanks are part of a wastewater treatment unit.

3.3.3 Air Heater and Fireside Wash Wastewater

This waste is exempt from Federal regulation according to 40CFR261.4(b)(4). Periodic water washing of air preheaters and boiler firesides removes fly ash, slag, and corrosion products. This waste has, in the past, been treated in the sumps which are being closed. This waste has the potential to have hazardous characteristics due to pH and metal corrosion products removed in the washing process. Therefore, HECO is upgrading its wastewater treatment system to handle this waste only in tanks.

3.3.4 Low Volume Waste

Low volume waste is primarily boiler blowdown and water from building drains. This is a non-hazardous waste. It is collected in a sump, the pH is adjusted, if necessary, and the waste is discharged in compliance with NPDES permit number HI0000027.

3.4 WASTE CHARACTERISTICS

All available waste stream analyses are summarized on Table 3-1. All analyses were performed by EPA approved methods. The treated wastewater and sludges are not hazardous. During generation of some of the cleaning wastes, extractable metal concentractions are occasionally above the EP Toxicity limits.

Condenser and boiler cleaning wastes and demineralizer regeneration wastes are typically corrosive before neutralization.

The sumps contain an estimated average of 6-inches of sludge (or 10%). The sludge normally has a very high water content.

TABLE 3-1

HONOLULU POWER PLANT
WASTE STREAM ANALYSIS

WASTE STREAM	EP TOXICITY mg/l As	Ba	Cd	Cr	Pb	Hg	Se	Ag	pH
Condenser Cleaning									
Unit 8, 9-25-82									
#81: 15 min.	0.20	<0.5	0.08	0.6	6.2	<0.01	<0.01	0.6	2.1
30 min.	0.27	<0.5	0.14	2.1	10.4	<0.01	<0.01	1.5	1.5
45 min.	0.22	<0.5	0.07	1.4	6.7	<0.01	<0.01	0.7	1.5
60 min.	0.40	<0.5	0.04	1.2	5.3	<0.01	<0.01	0.7	1.5
#82: 15 min.	0.37	<0.5	0.09	1.8	17.2	<0.01	<0.01	0.6	2.1
30 min.	0.57	<0.5	0.12	1.5	16.8	<0.01	<0.01	1.0	1.5
45 min.	0.25	<0.5	0.04	0.8	4.7	<0.01	<0.01	0.7	1.5
60 min.	0.28	<0.5	0.02	0.7	4.5	<0.01	<0.01	0.7	1.3
Unit 9, 9-26-82									
#91: 15 min.	0.07	<0.5	0.04	0.5	2.5	<0.01	<0.01	0.3	1.4
30 min.	0.41	<0.5	0.06	1.6	7.1	<0.01	<0.01	0.9	1.4
45 min.	0.38	<0.5	0.03	1.0	3.5	<0.01	<0.01	0.8	1.4
#92: 15 min.	0.12	<0.5	0.02	0.8	2.9	<0.01	<0.01	0.3	1.6
30 min.	0.58	<0.5	0.11	2.3	11.8	<0.01	<0.01	1.3	1.4
45 min.	0.42	<0.5	0.04	1.0	3.8	<0.01	<0.01	0.9	1.4
Sump #3									
Before Treatment:	<0.01	<0.5	0.02	0.6	0.8	<0.01	<0.01	0.4	2.7
After Treatment:	<0.01	<0.5	0.02	0.1	0.3	<0.01	<0.01	0.1	8.0
After Settling:	<0.01	<0.5	0.02	0.1	0.3	<0.01	<0.01	0.1	8.0
During Truck Loading:	<0.01	<0.5	0.02	0.2	0.4	<0.01	<0.01	0.1	8.0
Vertan 675									
2-5-73				14	5.5				9.3
9-5-84	0.05	1.0	1.0	3.5	2.6	0.005	0.017	0.07	10.0
8-28-84	0.005	<0.5	0.04	0.12	<0.1	0.001	0.001	<0.05	9.4

	EP TOXICITY mg/l								
WASTE STREAM	As	Ba	Cd	Cr	Pb	Hg	Se	Ag	pH
Demineralizer Waste									
Unit 1, 9-14-81									
Acid Drain	<0.01	<0.5	0.05	<0.1	0.2	<0.01	<0.01	<0.1	1.1
Caustic Drain	<0.01	<0.5	0.14	0.1	0.3	<0.01	<0.01	<0.1	12.8
Unit 2, 9-17-81									
Acid Drain	<0.01	<0.5	0.06	0.1	0.2	<0.01	<0.01	<0.1	1.1
Caustic Drain	0.01	<0.5	0.14	0.1	0.2	<0.01	<0.01	<0.1	12.7
Sludge									
Sump #4, 1-31-85	0.02	0.23	<0.005	<0.01	<0.05	0.002	0.003	<0.02	6.8
Transfer Yd. Sump 1-31-85	<0.001	0.18	<0.005	<0.01	<0.05	0.002	<0.001	<0.02	6.8
Sump #2, 2-19-82	0.1	<0.5	0.01	<0.1	<0.1	<0.01	<0.01	<0.1	9.5

4.0 CLOSURE

Hawaiian Electric Company has made the decision to upgrade the current wastewater management system at the Honolulu Generating Station. After construction and start-up of new wastewater treatment facilities and closure of sumps #2, 2A, and 3, all hazardous or potentially hazardous wastes generated by the power plant will be treated in tanks to render them non-hazardous. The tanks will be part of a wastewater treatment unit which is exempt from RCRA permit requirements. The expected start-up date for the new facilities is in January of 1986. After closure, the sumps will be returned to service for handling non-hazardous wastes.

Submission of this Closure Plan for approval also constitutes notification to EPA of intent to close all Honolulu Generating Station units which have handled potentially hazardous wastes. Therefore, per 40CFR265.112(c), closure is scheduled to begin 180 days after notification of intent to close and after approval of the Closure Plan by EPA. Therefore, closure is scheduled to begin in May of 1986. Until closure begins, HECO will continue to take all steps to prevent threats to human health and the environment and will maintain current security operations.

If EPA could approve this Closure Plan and waive the 180 day notification period, closure could begin anytime after start-up of the new treatment facilities in January of 1986. HECO will notify EPA immediately if construction delays or start-up problems occur which could affect the closure date.

When the sumps have been certified closed by Hawaiian Electric Company, Inc., and by an independent registered professional engineer, and a letter is received from EPA Region IX, acknowledging that closure is complete, there will be no hazardous waste left at the sumps, and they will be returned to service for non-hazardous waste use.

Hawaiian Electric Company is basing this Closure Plan on analyses which indicate that the treated liquid and sludge contained in the sumps are not hazardous. If the results of the Sampling and Analysis Program indicate that the sumps contain hazardous waste, and the hazardous wastes and hazardous waste residues cannot be either treated or removed, this Closure Plan and closure cost estimate will be revised and resubmitted to EPA Region IX for approval.

A schedule of the following closure steps is presented in Figure 4-1.

Step 1: Notification/Submission of Closure Plan

EPA Region IX will be notified 180 days or more prior to start of closure for approval of the Closure Plan.

Step 2: Decontamination of Lines

The piping system into the three sumps which have held hazardous wastes will be flushed with plant utility water for 2 to 3 minutes. A sample of the flush water will be taken during the last 30 seconds of rinsing. The sample will be analyzed per Attachment B for pH and EP toxicity for the metals listed on Table B-1 in Attachment B. If the results indicate that the flush water is hazardous, this flushing step will be repeated until the wash water is non-hazardous. If the lines cannot be adequately flushed, they will be removed and disposed of at an EPA approved facility. If a significant amount of scale is present in the pipes, a sample of the scale will be obtained. It will be analyzed for the same constituents as the sludge. (See Step 4). If the scale is hazardous, the contaminated piping will be removed. All analysis results will be submitted to EPA.

Step 3: Sample and Analyze Liquids in the Sumps

The liquid in the sumps will be sampled and analyzed for pH and EP toxicity, per the Sampling and Analysis Plan in Attachment B, to determine if it is a hazardous waste. All analysis results will be submitted to EPA.

Step 4: Sample and Analyze Sludge in the Sumps

The sludge in the sumps will be sampled and analyzed to determine if it is a hazardous waste, per the Sampling and Analysis Plan in Attachment B. All analysis results will be submitted to EPA.

Step 5: Review the Results of Steps 3 and 4

If the liquid and sludge in the sumps are non-hazardous the sumps are closed for hazardous waste handling, they will continue in non-hazardous services. Go to Step 10 to complete closure activities.

If the liquid or sludge is hazardous, as defined in Table B-1 in Attachment B, Sampling and Analysis Plan, and by statistical analysis based on EPA SW-846, closure will continue with the following steps.

Step 6: Waste Removal

The liquid in the sumps (hazardous or non-hazardous) can be handled in one of two ways. The liquid waste can be treated at the on-site wastewater treatment unit and be discharged in compliance with the facility's NPDES discharge permit. If, because of volume or level of contaminants, it cannot be adequately treated on-site, it will be treated or disposed of at an approved off-site facility. Non-hazardous waste can be shipped to HECO's Kahe Generating Station for treatment. Hazardous liquids will be collected by a licensed hazardous-waste transporter for disposal at a licensed hazardous waste disposal facility. Transportation and disposal of any hazardous waste will be tracked by a Uniform Hazardous Waste Manifest.

If the sludge in the sumps is non-hazardous, it will be removed by vacuum truck and disposed of in an environmentally acceptable manner. If the sludge is hazardous, it will be collected by a licensed hazardous waste transporter for disposal at an approved hazardous waste disposal facility. Transportation and disposal will be tracked by a Uniform Hazardous Waste Manifest.

Step 7: Decontamination of Concrete

If the sludge or liquid is hazardous, the sumps will be cleaned after removal of all waste in the sumps. The interior of each sump will be thoroughly cleaned by either hydroblasting or steam cleaning. All workers will wear protective clothing.

All washing residue will be contained in the sumps. It will then be removed and handled as a hazardous waste. It may be treated on-site at the wastewater treatment unit and discharged in compliance with the NPDES permit. Alternately, it can be collected by a licensed transporter for disposal at an approved hazardous waste facility. Transportation and disposal will be tracked by a Uniform Hazardous Waste Manifest.

Step 8: Sample, Analyze, and Inspect Concrete

The concrete in the sides and bottom of each sump will be sampled and analyzed to determine if it is contaminated with hazardous constituents. The sampling and analysis will be accomplished as described in Attachment B, Sampling and Analysis Plan. The concrete will be analyzed for pH and the EP toxicity constituents on Table B-1 in Attachment B. All analysis results will be submitted to EPA.

After cleaning, the concrete in each sump will be thoroughly inspected, once, by an independent professional engineer for pitting or cracking which might have allowed leakage.

Step 9: Review of Concrete Analysis and Inspection

If the results of the concrete analyses determine that the concrete is not hazardous, the sumps are considered closed for hazardous waste handling. The sump will continue in non-hazardous service. Step 10 will complete closure activities.

If the results of the concrete analyses indicate that the concrete is contaminated with hazardous waste constituents based on the levels on Table B-1 and by statistical analysis per EPA SW-846, closure activities will cease. The Closure Plan will be revised to allow HECO to investigate the extent of contamination and to determine the most appropriate closure procedures. Disposal closure will be considered as an option if the sump cannot be decontaminated. The sumps are an integral part of the building structure and cannot be removed. Based on recent test results of the sump

contents, it is unlikely that the concrete will be contaminatd. However, if it should occur, a revised closure plan will be submitted to EPA for approval.

If inspection of the concrete reveals structural damage which could have allowed leakage, a revised Closure Plan will be submitted. The revised closure plan will include procedures to determine the extent of any contamination which might have occurred.

Step 10: Certification of Closure

When closure is completed, HECO will submit a certification of closure activities to EPA Region IX. An independent professional engineer registered in Hawaii and an engineer from Hawaiian Electric Company will inspect the sumps after completion of all closure steps. They will certify that the sumps have been closed in accordance with all applicable steps in the approved Closure Plan.

5.0 DECONTAMINATION

5.1 DECONTAMINATION OF EQUIPMENT

The following decontamination procedures will be followed if any hazardous wastes are found.

All equipment, such as piping, trucks, samplers, trowels, and shovels used during closure will be cleaned before leaving the site or before re-use. A steam cleaner or water spray will be used to remove liquid and solid residue, since the water, sludge, or concrete is not expected to adhere strongly to the equipment. Cleaning of the equipment used at the site will take place either into a 55-gallon drum, back into the sumps, or on a waterproof tarp. The tarp will be placed on a graded area so that all liquid and residue can be contained and collected.

5.2 DECONTAMINATION RESIDUES

Decontamination residues, including washwater, will be treated in tanks at the on-site wastewater treatment unit and discharged in accordance with the facility's NPDES Discharge Permit number HI0000027. If, because of volume or concentration, the waste would exceed NPDES limits, the waste will be shipped off-site to HECO's Kahe or Waiau facility. If any sludge or

liquid is determined to be hazardous during closure, the tarp will be considered hazardous and will be transported to an off-site hazardous waste disposal facility by a registered transporter under a Uniform Hazardous Waste Manifest for disposal. If the sludges and wastewater are non-hazardous, the tarp will be washed with water. The washwater will be handled as a decontamination residue. The tarp will be disposed of in an environmentally sound manner.

MITTELHAUSER corporation

SAMPLING ANALYSIS REQUEST

PART I: Field Section

Collector _____ Date Sampled _____ Time _____ hours

Affiliation of Sampler _____

Address _____
number street city state zip

Telephone (___)_____ Company Contact _____

LABORATORY SAMPLE NUMBER	COLLECTOR'S SAMPLE NO.	TYPE OF SAMPLE*	FIELD INFORMATION**

Analysis Requested _____

_____

_____

Special Handling and/or Storage _____

_____

PART II: LABORATORY SECTION**

Received by _____ Title _____ Date_____

Analysis Required _____

_____

* Indicate whether sample is soil, sludge, etc.
**Use back of page for additional information relative to sample location.

FIGURE 6.2

7.0 CLOSURE COST ESTIMATE

Closure costs for the three sumps are summarized on Table 7-1. Recent analysis of the sump liquids and sludges conducted by approved test methods have demonstrated that the wastes do not exhibit the EP Toxicity or corrosivity characteristics. Therefore, this closure cost estimate summarizes the costs for sampling and analyzing liquids and sludges and treating the wastes in tanks at the on-site wastewater treatment unit and discharging the waste under NPDES permit number HI0000027.

Attachment D is a copy of HECO's financial assurance for the Kahe and Waiau facilities. This assurance is presently being revised to include the Honolulu facility.

TABLE 7-1

SUMMARY OF CLOSURE COSTS FOR HONOLULU GENERATING STATION

Step	Description	Cost
1	Notify EPA of Closure	N/C
2	Decontaminate lines	1,000
3	Sample and analyze liquid Sampling: 16 hrs @ $50/hr Analysis: 6 samples @ $400 ea	3,200
4	Sample and analyze sludge Sampling: 32 hrs @ $50/hr Analysis: 6 samples @ $450 ea	4,300
5	Review results of steps 3,4	3,000
6	Waste removal 37 cubic yards @ $100/cu yd	3,700
7	Decontaminate concrete surface	1,500
8	Sample and analyze concrete Sampling: 16 hrs @ $100/hr Analysis: 12 samples @ $450 ea	7,000
9	Review of step 8	2,000
10	Certification of closure PE: 20 hrs @100/hr. Expenses: $1000.	3,000
-	Project management	3,000
	TOTAL ESTIMATE	31,700

during overboarding, the overboard shutoff control valve will trip closed and simultaneously the overboard pump will automatically shut down.

F. Sump Cleaning

Sump cleaning involves the removal of liquid effluents and sludge deposits. Non-hazardous liquid effluents are discharged in compliance with NPDES requirements or are pumped into tanker trucks and hauled to HECO's Kahe plant for final treatment and disposal. Sludge removal involves: a) the use of a high pressure air lance to suspend the sludge matter into a slurry, and b) the pumping of this sludge slurry into tanker trucks for transport to Kahe for treatment and disposal.

Sludge is removed from each sump on an average of once a year.

wastewater will be continuously recirculated within the tank for 4 hours to ensure the precipitation process is carried to completion, thus rendering it non-hazardous. The non-hazardous waste will be drained into sump No. 2 or 3 for subsequent trucking to Kahe or Waiau.

3. The existing flow meter and strainer will be relocated to allow metering of the wastewater volume which will be drained from either tank No. 5 or No. 7 into sump No. 2 or 3, or directly to the trucks.

E. Boiler Draining

After shutdown and cooling of the boiler, the boiler water will be drained into the 1500 gallon surge tank, then pumped to sump No. 1,2 or 3. Little or no treatment is required. The tank and piping must first be flushed to clear out residue from the tubeside cleaning wastewater.

F. Overboarding

The existing normal overboard Pump No. 3 will take suction from sump No. 4, pump the wastewater through the DynaSand filter for final clarification, then discharge into a clean effluent holding tank. A new overboard pump controlled by the level in the holding tank will discharge through an existing displacement meter to the Honolulu Unit 8 and 9 condenser discharge tunnel.

The existing normal overboard pump is controlled by the sump water level and a pH monitor in the sump. A high water level and normal pH reading between 6 and 9 will start the pump. A low sump level or pH readings greater than 9 or less than 6 will stop the pump.

G. Sump Cleaning

Sump cleaning involves the removal of liquid effluents and sludge deposits. Non-hazardous liquid effluents are discharged in compliance with NPDES requirements or are pumped into tanker trucks and hauled to HECO's Kahe plant for final treatment and disposal. Sludge removal involves: a) the use of a high pressure air lance to suspend the sludge matter into a slurry, and b) the pumping of this sludge slurry into tanker trucks for transport to Kahe for treatment and disposal.

Sludge is removed from each sump on an average of once a year.

ATTACHMENT B

SAMPLING AND ANALYSIS PLAN

INTRODUCTION

Honolulu Generating Station is closing three sumps which have handled potentially hazardous waste. A sampling and analysis program will be performed to characterize the liquid, sludge and, if necessary, concrete in each sump. The results of this program will establish the method of closure and the quantity of material (if any) to be removed.

LIQUID IN THE SUMPS

The surface area of each sump will be divided into half. One grab sample from each half will be taken and analyzed. The two samples will be representative of the sump from which they were taken.

A coliwasa or equivalent will be used to obtain the liquid samples. If the waste is stratified, a sample will be obtained from each layer. The sampling device will be rinsed after each sampling with distilled water, and the rinse water will be placed in the pond.

Each grab sample will be transferred to a sample bottle prepared prior to sampling by the analytical laboratory with the correct preservative per EPA Publication SW-846. Each sample bottle will be labeled with a waterproof marker prior to filling the bottle.

The waste streams discharged to the sumps were potentially hazardous for the characteristics of corrosivity and EP Toxicity for metals. Therefore, these liquid samples will be analyzed for pH and for trace quantities of the following metals: arsenic, barium, cadmium, chromium, lead, selenium, silver and mercury. The methodology and concentration limits for these constituents are shown in Table B-1.

SLUDGE IN THE SUMPS

At each of the sumps, the surface area will be divided into half. A sample of sludge will be obtained from each half of the sump for analysis. The two sludge samples will be representative of each sump. If the waste is stratified, a sample will be obtained from each layer.

The sludge samples will be obtained using a weighted bottle sampler, dipper, coliwasa or equivalent. The sampler will be rinsed with distilled water prior to sampling, and the rinse water and residues will be placed back into the sump.

The containers for each composite sample will be either wide-mouthed glass jars covered with a Teflon-lined screw cap or zip-lock bags. A minimum of 200 grams will be collected for each sample.

Sludge samples will be tested for pH and the EP Toxicity characteristic. The parameters, concentration limits and methodology are shown on Table B-1.

CONCRETE AT THE SUMPS

Samples of the concrete will be taken for analysis only if the liquid or sludge samples are determined to have hazardous metallic concentrations. After all hazardous waste has been removed from the sump, the concrete washed, and the wash water removed, the surface area of the sump will be divided into quadrants and a composite sample will be taken from each quadrant. Samples will be chipped from six random locations in each quadrant (including the walls) using a hammer and chisel. The chips will then be combined to provide one sample for each quadrant. One additional sample of concrete will be obtained from the sump in an area which has not been in contact with the liquid waste. This will establish a background level for metallic concentrations in the concrete.

Each sample of approximately 500 grams will be placed in wide-mouthed glass jars or polyethylene bags (or equivalent).

The concrete samples will be analyzed for the same characteristics as the sludge: EP Toxicity characteristic for metals (arsenic, barium, cadmium, chromium, lead, selenium, silver and mercury) and for pH. The results of these analyses will allow the Honolulu Generating Station staff to determine if the concrete is contaminated with hazardous waste. The methodology and concentration limits for these constituents are shown on Table B-1.

SAMPLE CONTROL

Each sample container will be labeled with the following information at the time of sampling:

- Sample Number
- Sample Location
- Waste Type
- Date of Sample
- Time of Sample
- Name of Sampler

Seals will be applied to each container immediately after collection to prevent tampering with the samples. The seals will display the following information:

- Sample Number
- Date of Sample
- Collector's Name

One blank sample will be prepared on-site on each day of sampling. The blank will be distilled water transferred to a sample bottle at the site. The samples will be placed in a container and packed in ice. They will then be sent to the laboratory. The Chain of Custody procedures that are described in EPA SW-846 will be followed.

The information pertinent to sampling the liquid, sludge and concrete in the sumps will be recorded in a hard bound log book. Entries in the log book will include the following information:

- Purpose of sampling
- Description of sampling point
- Field contact
- Type of waste sampled
- Description of sampling methodology
- Depth of liquid or sludge at time of sampling
- Depth of sample
- Date and time of collection
- Weather at time of collection
- Field measurements
- Photos, if taken
- Signature of personnel responsible for sampling
- Field observations
- Number and volume of samples
- Sample distribution
- Transportation

TABLE B-1

EXTRACTION PROCEDURE LIMITS AND METHODOLOGY

Constituent	Method[1]	EP Toxicity Limit Milligrams/liter (mg/l)
Arsenic	7060 or 7061	5.0
Barium	7080 or 7081	100.0
Cadmium	7130 or 7131	1.0
Chromium	7190 or 7191	5.0
Lead	7420 or 7421	5.0
Mercury	7470	0.2
Selenium	7740 or 7741	1.0
Silver	7760 or 7761	5.0
pH[2]	9040	-

The method for the Extraction Procedure is 1310 from EPA SW-846.

1. All methods are from EPA SW-846, "Test Methods for Evaluating Solid Waste".
2. pH must be greater than 2.0 and less than 12.5.

ATTACHMENT C

SUMP DIAGRAMS

ATTACHMENT D

FINANCIAL ASSURANCE

HAWAIIAN ELECTRIC COMPANY, INC. · PO BOX 2750 · HONOLULU, HAWAII 96

HEI

March 29, 1985

Ms. Judith E. Ayres
Regional Administrator
Environmental Protection Agency
215 Fremont Street
San Francisco, California 94105

Dear Ms. Ayres:

Enclosed is the documentation necessary for Hawaiian Electric Company (HECO) to comply with the annual EPA liability requirements for sudden and non-sudden accidental pollution and closure care. The financial test has been used to provide liability for the $10,540,000 annual aggregate.

Provided for compliance is the following:

1. A letter from Hawaiian Electric's chief financial officer and controller, Mr. Paul A. Oyer, stating compliance with the liability requirements enabling Hawaiian Electric to demonstrate financial capability.

2. Letter from Peat, Marwick, Mitchell & Co. to the Board of Directors of Hawaiian Electric Company stating that the related statements evidenced in the financial tests are in accordance with generally accepted auditing standards (Exhibit A).

3. A copy of the Opinion of Independent Certified Public Accountants dated February 12, 1985 (Exhibit B).

4. A copy of Hawaiian Electric Company's Consolidated Financial Statements and Consolidating Schedules as of December 31, 1984, 1983 and 1982 prepared by Peat, Marwick, Mitchell & Co. (Exhibit C).

With these submittals, Hawaiian Electric Company will be in compliance with the Environmental Protection Agency's standards applicable to owners and operators of hazardous wastes treatment, storage, and disposal facilities to date.

Sincerely,

Susan R. Welch

Susan R. Welch
Director, Insurance & Claims

SRW:wp

Enclosures

cc: B. Munger, HECO

HAWAIIAN ELECTRIC COMPANY, IN PO BOX 2750 · HONOLULU, HI 96840-0

HEI

Paul A. Oyer
Financial Vice President and Controller

March 29, 1985

Letter from the Chief Financial Officer to Demonstrate Liability Coverage and Assurance of Closure Care

Ms. Judith E. Ayres
Regional Administrator
Environmental Protection Agency
215 Fremont Street
San Francisco, California 94105

Dear Ms. Ayres:

I am the chief financial officer of Hawaiian Electric Company, Inc., P. O. Box 2750, Honolulu, Hawaii 96840. This letter is in support of the use of the financial test to demonstrate financial responsibility for liability coverage and closure care as specified in Subpart H of 40 CFR Parts 264 and 265.

The owner or operator identified above is the owner or operator of the following facilities for which liability coverage is being demonstrated through the financial test specified in Subpart H of 40 CFR Parts 264 and 265.

Facility

HIT 000 610923
Kahe Generating Station (HECO)
P. O. Box 2750
Honolulu, HI 96840

HIT 000 610873
Waiau Generating Station (HECO)
P. O. Box 2750
Honolulu, HI 96840

1. The owner or operator identified above owns or operates the following facilities for which financial assurance for closure care is demonstrated through the financial test specified in Subpart H of 40 CFR Parts 264 and 265. The current closure cost estimates covered by the test are shown for each facility:

Facility	1985 Closure Costs
HIT 000 610923 Kahe Generating Station (HECO) P. O. Box 2750 Honolulu, HI 96840	$1,400,000
HIT 000 610873 Waiau Generating Station (HECO) P. O. Box 2750 Honolulu, HI 96840	$1,140,000

2. The owner or operator identified above guarantees, through the corporate guarantee specified in Subpart H of 40 CFR Parts 264 and 265, the closure care of the following facilities owned or operated by its subsidiaries. The current cost estimates for the closure care so guaranteed are shown for each facility: None.

3. In States where EPA is not administering the financial requirements of Subpart H of 40 CFR Parts 264 and 265, this owner or operator is demonstrating financial assurance for the closure or post-closure care of the following facilities through the use of a test equivalent or substantially equivalent to the financial test specified in Subpart H of 40 CFR Parts 264 and 265. The current closure and/or post-closure cost estimates covered by such a test are shown for each facility: None.

4. The owner or operator identified above owns or operates the following hazardous waste management facilities for which financial assurance for closure or, if a disposal facility, post-closure care, is not demonstrated either to EPA or a State through the financial test or any other financial assurance mechanism specified in Subpart H of 40 CFR Parts 264 and 265 or equivalent or substantially equivalent State mechanisms. The current closure and/or post-closure cost estimates not covered by such financial assurance are shown for each facility: None.

This owner or operator is required to file a Form 10K with the Securities and Exchange Commission (SEC) for the latest fiscal year.

The fiscal year of this owner or operator ends on December 31. The figures for the following items marked with an asterisk are derived from this owner's or operator's independently audited, year-end financial statements for the latest completed fiscal year, ended December 31, 1984.

PART B. Closure Care and Liability Coverage

ALTERNATIVE II

1.	Sum or current closure and post closure cost estimates (total of all cost estimates listed above).	$ 2,540,000
2.	Amount of annual aggregate liability coverage to be demonstrated.	$ 8,000,000
3.	Sum of lines 1 and 2	$10,540,000
4.	Current bond rating of most recent issuance and name of rating service	A+Standard & Poor's Co
5.	Date of issuance of bond	January 13, 1982
6.	Date of maturity of bond	December 1, 1991
*7.	Tangible net worth (if any portion of the closure or post-closure cost estimates is included in "total liabilities" on your financial statements you may add that portion to this line).	$246,531,000
*8.	Total assets in the U.S. (required only if less than 90% of assets are located in the U.S.).	N/A

HEI

		Yes	No
9.	Is line 7 at least $10 million?	X	___
10.	Is line 7 at least 6 times line 1?	X	___
*11.	Are at least 90% of assets located in the U.S.? If not, complete line 12.	X	___
*12.	Is line 8 at least 6 times line 1?	N/A	___

I hereby certify that the wording of this letter is identical to the wording specified in 40 CFR 264.151(g) as such regulations were constituted on the date shown immediately below.

Paul Oyer

Paul A. Oyer
Financial Vice President and Controller
March 29, 1985

PEAT MARWICK

Peat, Marwick, Mitchell & Co.
Certified Public Accountants
Financial Plaza Of The Pacific
P.O. Box 4150
Honolulu, Hawaii 96813
808-531-7286

March 29, 1985

The Board of Directors
Hawaiian Electric Company, Inc.
P. O. Box 2750
Honolulu, Hawaii 96840

Dear Sirs:

We have examined the consolidated balance sheet and consolidated statement of capitalization of Hawaiian Electric Company, Inc. and subsidiaries as of December 31, 1984 and the related consolidated statements of income, retained earnings and sources of funds for construction for the year then ended and have issued our report thereon dated February 12, 1985. Our examination was made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the aforementioned consolidated financial statements present fairly the financial position of Hawaiian Electric Company, Inc. and subsidiaries at December 31, 1984 and the results of their operations and the sources of funds for construction for the year then ended, in conformity with generally accepted accounting principles applied on a consistent basis.

The accompanying letter from the Company specifies certain data as having been derived from the aforementioned financial statements. We have (1) compared the dollar amounts of Common Stock Equity and Other Assets (Intangible Assets) at December 31, 1984 as set forth in the Company's Schedule of Tangible Net Worth to the aforementioned financial statements and found them to be in agreement and (2) recomputed the Tangible Net Worth and found it to be mathematically correct.

Nothing came to our attention as a result of the foregoing procedures that caused us to believe that the specified data should be adjusted. The foregoing procedure does not constitute an examination in accordance with generally accepted auditing standards.

Very truly yours,

Peat, Marwick, Mitchell & Co.

Exhibit A

OPINION OF INDEPENDENT CERTIFIED PUBLIC ACCOUNTANTS

The Board of Directors and Shareholder
Hawaiian Electric Company, Inc.:

We have examined the consolidated balance sheets and consolidated statements of capitalization of Hawaiian Electric Company, Inc. (a wholly owned subsidiary of Hawaiian Electric Industries, Inc.) and subsidiaries as of December 31, 1984, 1983 and 1982 and the related consolidated statements of income, retained earnings and sources of funds for construction for the years then ended. Our examinations were made in accordance with generally accepted auditing standards and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the aforementioned consolidated financial statements present fairly the financial position of Hawaiian Electric Company, Inc. and subsidiaries at December 31, 1984, 1983 and 1982, and the results of their operations and the sources of funds for construction for the years then ended, in conformity with generally accepted accounting principles applied on a consistent basis.

Peat, Marwick, Mitchell & Co.

Peat, Marwick, Mitchell & Co., Honolulu, Hawaii
February 10, 1985

HAWAIIAN ELECTRIC COMPANY'S

CONSOLIDATED FINANCIAL STATEMENTS AND

CONSOLIDATING SCHEDULES AS OF

DECEMBER 31, 1984, 1983 and 1982

PREPARED BY PEAT, MARWICK, MITCHELL & CO.

(EXHIBIT C)

(Not attached)

HAWAIIAN ELECTRIC COMPANY, IN PO BOX 2750 · HONOLULU, HI 96840-00

HEI

July 31, 1985

Ms. Judith E. Ayres
Regional Administrator
Environmental Protection Agency
215 Fremont Street
San Francisco, CA 94105

Dear Ms. Ayres:

RE: Hawaiian Electric Company, Inc.
Revision of March 29, 1985 EPA Liability
Assumption Requirements

Hawaiian Electric Company, Inc. (HECO) has recently completed renewing its General Liability insurance policies, having an effective date of March 31, 1985.

When HECO submitted the documentation necessary to comply with the annual EPA liability requirements for sudden and non-sudden accidental pollution and closure costs on March 29, 1985, it did not appear that HECO would be able to purchase the coverages. Therefore, it submitted the documents enabling HECO to demonstrate financial capability to be self-insured.

However, HECO has been able to purchase insurance for part of its exposure and is now submitting a revision to its original March 29, 1985 version.

A schedule of coverage and self-insured retention is enclosed, (Exhibit "A"). Also enclosed are the Certificates of Insurance showing coverage for sudden accidental with limit of $2 million (Exhibits "B" and "C"); and, for non-sudden accidental coverage, a limit of $2.5 million (Exhibit "D").

Attached also for your reference is a copy of the original submission dated March 29, 1985 (Exhibit "E") which you undoubtedly have in file.

Sincerely,

Susan R. Welch

Susan R. Welch
Director, Insurance & Claims

SRW:GY:mo

Enclosures

cc: B. Munger (w/o encls.)

HAWAIIAN ELECTRIC COMPANY, INC.

U. S. Environmental Protection Agency

Certificate of Insurance

Company	Policy No.	Sudden Accidental Bodily Injury & Property Damage Combined Single Limits Occurrence	Sudden Accidental Bodily Injury & Property Damage Combined Single Limits Aggregate	Non-Sudden Accidental Bodily Injury & Property Damage Combined Single Limits Occurrence	Non-Sudden Accidental Bodily Injury & Property Damage Combined Single Limits Aggregate
Insurance Co. of North America	ISLGO-569519-3	$ 1,000,000	$ 1,000,000	$ -	$ -
Holland America Insurance Company	H-96692	Not Required	1,000,000	-	-
Self-Insured Retention *		-	-	2,000,000	2,000,000
Associated Electric & Gas Services, Ltd.	303CNJ	-	-	1,000,000	2,500,000
Self-Insured Retention *		-	-	Not Required	1,500,000
Totals:		$ 1,000,000	$ 2,000,000	$ 3,000,000	$ 6,000,000

* HECO has submitted on March 29, 1985 to the EPA documentation necessary to comply with the annual EPA liability requirements for sudden and non-sudden accidental pollution and closure costs.

7/26/85
Insurance & Claims

EXHIBIT A

ACORD CERTIFICATE OF INSURANCE

ISSUE DATE (MM/DD/YY) 7-8-85

PRODUCER

CERTIFICATE NO. KPA 1-85

JOHNSON & HIGGINS OF HAWAII, INC.
P. O. BOX 4238
HONOLULU, HAWAII 96813

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

INSURED

HAWAIIAN ELECTRIC INDUSTRIES, INC.
HAWAIIAN ELECTRIC COMPANY, INC.
HAWAII ELECTRIC LIGHT COMPANY, INC.
MAUI ELECTRIC COMPANY, LTD.

COMPANIES AFFORDING COVERAGE

COMPANY LETTER A	INSURANCE COMPANY OF NORTH AMERICA
COMPANY LETTER B	
COMPANY LETTER C	
COMPANY LETTER D	
COMPANY LETTER E	

COVERAGES

THIS IS TO CERTIFY THAT POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS, AND CONDITIONS OF SUCH POLICIES.

CO LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIABILITY LIMITS IN THOUSANDS	EACH OCCURRENCE	AGGREGATE
A	GENERAL LIABILITY X COMPREHENSIVE FORM X PREMISES/OPERATIONS X UNDERGROUND EXPLOSION & COLLAPSE HAZARD X PRODUCTS/COMPLETED OPERATIONS X CONTRACTUAL X INDEPENDENT CONTRACTORS X BROAD FORM PROPERTY DAMAGE PERSONAL INJURY	ISLGO 569519-3	3/31/85	3/31/86	BODILY INJURY	$	$
					PROPERTY DAMAGE	$	$
					BI & PD COMBINED	$1,000	$1,000
					PERSONAL INJURY		$1,000
	AUTOMOBILE LIABILITY ANY AUTO ALL OWNED AUTOS (PRIV. PASS.) ALL OWNED AUTOS (OTHER THAN PRIV. PASS.) HIRED AUTOS NON-OWNED AUTOS GARAGE LIABILITY				BODILY INJURY (PER PERSON)	$	
					BODILY INJURY (PER ACCIDENT)	$	
					PROPERTY DAMAGE	$	
					BI & PD COMBINED	$	
	EXCESS LIABILITY UMBRELLA FORM OTHER THAN UMBRELLA FORM				BI & PD COMBINED	$	$
	WORKERS' COMPENSATION AND EMPLOYERS' LIABILITY				STATUTORY		
						$ (EACH ACCIDENT)	
						$ (DISEASE-POLICY LIMIT)	
						$ (DISEASE-EACH EMPLOYEE)	
	OTHER						

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/SPECIAL ITEMS

SUDDEN ACCIDENTAL OCCURRENCES
(SEE MANUSCRIPT FORM ATTACHED)

CERTIFICATE HOLDER

UNITED STATES OF AMERICA
U.S. ENVIRONMENTAL PROTECTION AGENCY
REGIONAL ADMINISTRATOR
215 FREMONT STREET
SAN FRANCISCO, CA 94105

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL ENDEAVOR TO MAIL 60 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE COMPANY, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE

By

July 8, 1985

CERTIFICATE OF INSURANCE

1. Insurance Company of North America, Philadelphia, Pennsylvania, hereby certifies that it has issued liability insurance covering bodily injury and property damage to

Hawaiian Electric Company, Inc.
P. O. Box 2750
Honolulu, Hawaii 96840

in connection with the Insured's obligation to demonstrate financial responsibility under 40 CFR 264.147 or 40 CFR 265.147.

The coverage for sudden accidental occurrences applies at

HIT 000 610923 Kahe Generating Station
HIT 000 610873 Waiau Generating Station
HID 000 150680 Honolulu Generating Station

all with addresses of

P. O. Box 2750
Honolulu, Hawaii 96840

The limits of liability are

$1,000,000 each occurrence and
$1,000,000 annual aggregate

exclusive of legal defense costs. The coverage is provided under policy number ISLG0569519-3 issued on May 5, 1985. The effective date of said policy is March 31, 1985.

2. The Insurer further certifies the following with respect to the insurance described in paragraph 1:

(a) Bankruptcy or insolvency of the Insured shall not relieve the Insurer of its obligations under the policy.

(b) The Insurer is liable for the payment of amounts within any deductible applicable to the policy with a right of reimbursement by the Insured for any such payments made by the Insurer. This provision does not apply with respect to that amount of any deductible for which coverage is demonstrated as specified in 40 CFR 264.147(f) or 40 CFR 265.147(f).

(c) Whenever requested by a Regional Administrator of the U. S. Environmental Protection Agency (EPA), the Insurer agrees to furnish to the Regional Administrator a signed duplicate original of the policy and all endorsements.

(d) Cancellation of the insurance, whether by the Insurer or the Insured, will be effective only upon written notice and only after the expiration of sixty (60) days after a copy of such written notice is received by the Regional Administrator of the EPA region in which the facilities are located.

(e) Any other termination of the insurance will be effective only upon written notice and only after the expiration of thirty (30) days after a copy of such written notice is received by the Regional Administrator of the EPA region in which the facilities are located.

I hereby certify the wording of this instrument is identical to the wording specified in 40 CFR 264.151(j) as such regulation was constituted on the date first above written, and that the Insurer is licensed to transact the business of insurance or eligible to provide insurance as an excess or surplus lines insurer in one or more States.

William F. Gleason
President

Authorized Representative of

Insurance Company of North America
c/o Johnson & Higgins of Hawaii, Inc.
P. O. Box 4238
Honolulu, HI 96813

ACORD CERTIFICATE OF INSURANCE

ISSUE DATE (MM/DD/YY) 7/8/85

PRODUCER

CERTIFICATE NO. EPA-2-85
JOHNSON & HIGGINS OF HAWAII, INC.
P. O. BOX 4238
HONOLULU, HI 96813

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

INSURED

HAWAIIAN ELECTRIC INDUSTRIES, INC.
HAWAIIAN ELECTRIC COMPANY, INC.
HAWAII ELECTRIC LIGHT COMPANY, INC.
MAUI ELECTRIC COMPANY, LTD.

COMPANIES AFFORDING COVERAGE

COMPANY LETTER A	HOLLAND-AMERICA INSURANCE COMPANY
COMPANY LETTER B	
COMPANY LETTER C	
COMPANY LETTER D	
COMPANY LETTER E	

COVERAGES

THIS IS TO CERTIFY THAT POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS, AND CONDITIONS OF SUCH POLICIES.

CO LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIABILITY LIMITS IN THOUSANDS	EACH OCCURRENCE	AGGREGATE
	GENERAL LIABILITY						
	COMPREHENSIVE FORM				BODILY INJURY	$	$
	PREMISES/OPERATIONS				PROPERTY DAMAGE	$	$
	UNDERGROUND EXPLOSION & COLLAPSE HAZARD				BI & PD COMBINED	$	$
	PRODUCTS/COMPLETED OPERATIONS						
	CONTRACTUAL						
	INDEPENDENT CONTRACTORS						
	BROAD FORM PROPERTY DAMAGE				PERSONAL INJURY		$
	PERSONAL INJURY						
	AUTOMOBILE LIABILITY				BODILY INJURY (PER PERSON)	$	
	ANY AUTO				BODILY INJURY (PER ACCIDENT)	$	
	ALL OWNED AUTOS (PRIV. PASS.)				PROPERTY DAMAGE	$	
	ALL OWNED AUTOS (OTHER THAN PRIV. PASS.)				BI & PD COMBINED	$	
	HIRED AUTOS						
	NON-OWNED AUTOS						
	GARAGE LIABILITY						
A	EXCESS LIABILITY						
X	UMBRELLA FORM	H-96692	3/31/85	3/31/86	BI & PD COMBINED	$	$1,000
	OTHER THAN UMBRELLA FORM						
	WORKERS' COMPENSATION AND EMPLOYERS' LIABILITY				STATUTORY		
						$	(EACH ACCIDENT)
						$	(DISEASE-POLICY LIMIT)
						$	(DISEASE-EACH EMPLOYEE)
	OTHER						

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/SPECIAL ITEMS

SUDDEN ACCIDENTAL OCCURRENCES
(SEE MANUSCRIPT FORM ATTACHED)

CERTIFICATE HOLDER

UNITED STATES OF AMERICA
U.S. ENVIRONMENTAL PROTECTION AGENCY
REGIONAL ADMINISTRATION
215 FREMONT STREET
SAN FRANCISCO, CA 94105

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL ENDEAVOR TO MAIL 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE COMPANY, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE

July 8, 1985

CERTIFICATE OF INSURANCE

1. Holland America Insurance Company, Kansas City, Missouri, hereby certifies that it has issued liability insurance covering bodily injury and property damage to

Hawaiian Electric Company, Inc.
P. O. Box 2750
Honolulu, Hawaii 96840

in connection with the Insured's obligation to demonstrate financial responsibility under 40 CFR 264.147 or 40 CFR 265.147.

The coverage for sudden accidental occurrences applies at

HIT 000 610923 Kahe Generating Station
HIT 000 610873 Waiau Generating Station
HID 000 150680 Honolulu Generating Station

all with addresses of

P. O. Box 2750
Honolulu, Hawaii 96840

The limit of liability is

$1,000,000 annual aggregate

The coverage is provided under policy number H-96692 issued on April 2, 1985. The effective date of said policy is March 31, 1985.

2. The Insurer further certifies the following with respect to the insurance described in paragraph 1:

(a) Bankruptcy or insolvency of the Insured shall not relieve the Insurer of its obligations under the policy.

(b) The Insurer is liable for the payment of amounts within any deductible applicable to the policy with a right of reimbursement by the Insured for any such payments made by the Insurer. This provision does not apply with respect to that amount of any deductible for which coverage is demonstrated as specified in 40 CFR 264.147(f) or 40 CFR 265.147(f).

(c) Whenever requested by a Regional Administrator of the U. S. Environmental Protection Agency (EPA), the Insurer agrees to furnish to the Regional Administrator a signed duplicate original of the policy and all endorsements.

(d) Cancellation of the insurance, whether by the Insurer or the Insured, will be effective only upon written notice and only after the expiration of sixty (60) days after a copy of such written notice is received by the Regional Administrator of the EPA region in which the facilities are located.

(e) Any other termination of the insurance will be effective only upon written notice and only after the expiration of thirty (30) days after a copy of such written notice is received by the Regional Administrator of the EPA region in which the facilities are located.

I hereby certify the wording of this instrument is identical to the wording specified in 40 CFR 264.151(j) as such regulation was constituted on the date first above written, and that the Insurer is licensed to transact the business of insurance or eligible to provide insurance as an excess or surplus lines insurer in one or more states.

William F. Gleason
President

Authorized Representative of

Holland American Insurance Company
c/o Johnson & Higgins of Hawaii, Inc.
P. O. Box 4238
Honolulu, HI 96813

EXHIBIT D

ASSOCIATED ELECTRIC & GAS INSURANCE SERVICES LIMITED

Hamilton, Bermuda

'IFICATE NO. EPA-3-85

CERTIFICATE OF INSURANCE

The undersigned hereby certify that the following described insurance is in force at this date with Associated Electric & Gas Insurance Services Limited.

NAME OF INSURED: HAWAIIAN ELECTRIC INDUSTRIES,INC., HAWAIIAN ELECTRIC COMPANY,INC. HAWAII ELECTRIC LIGHT COMPANY,INC., MAUI ELECTRIC COMPANY,LTD.

PRINCIPAL ADDRESS: P. O. BOX 2750
HONOLULU, HI 96840

POLICY NUMBER: 303 CNJ

POLICY PERIOD: FROM: MARCH 31, 1985 TO: MARCH 31, 1986

LIMIT OF LIABILITY: $1,000,000 OCCURRENCE EXCESS $2,000,000 OCCURRENCE SIR — $2,500,000 AGGREGATE EXCESS $2,000,000 AGGREGATE SIR

DESCRIPTION OF COVERAGE:

NON SUDDEN ACCIDENTAL OCCURRENCES
(SEE MANUSCRIPT FORM ATTACHED)

[redacted]

Should the above mentioned contract of insurance be cancelled, [redacted] during the above named policy period in such manner as to affect this document, we will [redacted] give notice to the holder of this document. 60 DAYS WRITTEN NOTICE OF CANCELLATION

DATE: JULY 8, 1985

ISSUED TO: UNITED STATES OF AMERICA, U.S. ENVIRONMENTAL PROTECTION AGENCY, REGIONAL ADMINISTRATION

ADDRESS: 215 FREMONT STREET, SAN FRANCISCO, CA. 94105

AEGIS INSURANCE SERVICES, INC.

BY: Sandra A. Johnson

At Jersey City, New Jersey

7500 (AIS) 8/84)

July 8, 1985

CERTIFICATE OF INSURANCE

1. Associated Electric & Gas Insurance Services, Limited, Hamilton, Bermuda, hereby certifies that it has issued liability insurance covering bodily injury and property damage to

Hawaiian Electric Company, Inc.
P. O. Box 2750
Honolulu, Hawaii 96840

in connection with the Insured's obligation to demonstrate financial responsibility under 40 CFR 264.147 or 40 CFR 265.147.

The coverage for nonsudden accidental occurrences applies at

HIT 000 610923 Kahe Generating Station
HIT 000 610873 Waiau Generating Station
HID 000 150680 Honolulu Generating Station

all with addresses of

P. O. Box 2750
Honolulu, Hawaii 96840

The limits of liability are

$1,000,000 occurrence excess of $2,000,000 occurrence SIR	$2,500,000 aggregate excess of $2,000,000 aggregate SIR

exclusive of legal defense costs. The coverage is provided under Associated Electric & Gas Insurance Services, Limited policy number 303 CNJ issued on July 9, 1985. The effective date of said policy is March 31, 1985.

2. The Insurer further certifies the following with respect to the insurance described in paragraph 1:

(a) Bankruptcy or insolvency of the Insured shall not relieve the Insurer of its obligations under the policy.

(b) The Insurer is liable for the payment of amounts within any deductible applicable to the policy with a right of reimbursement by the Insured for any such payments made by the Insurer. This provision does not apply with respect to that amount of any deductible for which coverage is demonstrated as specified in 40 CFR 264.147(f) or 40 CFR 265.147(f).

(c) Whenever requested by a Regional Administrator of the U. S. Environmental Protection Agency (EPA), the Insurer agrees to furnish to the Regional Administrator a signed duplicate original of the policy and all endorsements.

(d) Cancellation of the insurance, whether by the Insurer or the Insured, will be effective only upon written notice and only after the expiration of sixty (60) days after a copy of such written notice is received by the Regional Administrator of the EPA region in which the facilities are located.

(e) Any other termination of the insurance will be effective only upon written notice and only after the expiration of thirty (30) days after a copy of such written notice is received by the Regional Administrator of the EPA region in which the facilities are located.

I hereby certify the wording of this instrument is identical to the wording specified in 40 CFR 264.151(j) as such regulation was constituted on the date first above written, and that the Insurer is licensed to transact the business of insurance or eligible to provide insurance as an excess or surplus lines insurer in one or more states.

William F. Gleason
President

Authorized Representative of

Associated Electric & Gas Insurance Services, Limited
c/o Johnson & Higgins of Hawaii, Inc.
P. O. Box 4238
Honolulu, HI 96813

CLOSURE PLAN AND COST ESTIMATE
FOR
THREE EXISTING SUMPS
LOCATED AT
HONOLULU GENERATING STATION

Prepared for:

HAWAIIAN ELECTRIC COMPANY, INC.
HONOLULU, HAWAII

Prepared by:

MITTELHAUSER CORPORATION
EL TORO, CALIFORNIA

NOVEMBER, 1985

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SECTION 1.0

INTRODUCTION

CLOSURE PLAN AND CLOSURE COST ESTIMATE

1.0 INTRODUCTION

This closure document has been prepared for the Hawaiian Electric Company's Honolulu Generating Station which is located in Honolulu, Hawaii. The plan is being submitted to EPA Region IX for approval before initiating closure of three concrete sumps which have handled potentially hazardous waste. The owner, facility name, address, type of industry, type of hazardous waste management unit being closed, local contact, and EPA Identification Number are presented below:

- Owner: Hawaiian Electric Company, Inc. (HECO)
- Name: Honolulu Generating Station
- Type of Industry: Power Generation SIC Code 4911
- Facility Address: 170 Ala Moana Blvd. Honolulu, Hawaii 96813
- Facility Telephone: 1-808-548-3538
- Facility Contact: Leonard DeCorte Station Superintendent
- Corporate Address: P.O. Box 2750 Honolulu, Hawaii 96840

- Corporate Contact: Dr. Brenner Munger, Manager, Environmental Department
- Corporate Telephone: 1-808-548-6880
- EPA ID Number: HID000150680
- Unit Closing: Three Existing Concrete Sumps
  - sump #2
  - sump #2A
  - sump #3

This plan was prepared using the following as a basis: Resource Conservation and Recovery Act (RCRA) of 1976 (PL 94-580), as amended; and EPA SW-846: "Test Methods for Evaluating Solid Wastes." Copies of this plan and revisions, if any, will be kept at the following locations until closure is completed:

- Operations Superintendent's Office - on-site
- Manager of Environmental Department's Office - Corporate Office

Closure is considered complete when the closure steps in Chapter 4 have been certified complete by Hawaiian Electric Company and by an independent registered engineer and when a letter has been received from EPA agreeing that closure is complete.

This closure plan is for the closure of three sumps. These sumps are being closed as interim status RCRA facilities. They have, in the past, stored potentially hazardous wastewater

which may have had the characteristics of corrosivity or of EP Toxicity for metals content. Therefore, HECO is closing the unit in accordance with RCRA interim status regulations guidelines to ensure that the unit does not present a threat to human health or the environment.

Closure of the three sumps will be coordinated with construction and start-up of new treatment facilities which are exempt from RCRA permit requirements. After start-up of the new system, all hazardous or potentially hazardous wastes will be treated in above grade tanks. The tanks treating hazardous wastes will be part of a wastewater treatment unit, as defined in 40CFR260.10. Wastewater treatment units are exempt from RCRA Part B Permit requirements under the standards set forth in 40CFR270.1(c)(2)(v). Fireside and Air Heater Washwater, which is exempt from RCRA regulation per 40CFR261.4(b)(4), will also be treated solely in tanks. Although this waste is exempt from RCRA regulation, HECO recognizes that it can potentially be corrosive or have the characteristic of EP Toxicity. Therefore, the Honolulu wastewater treatment system is being modified to handle this waste in a way which will eliminate any potential threat to human health or the environment.

More detailed descriptions of the existing and proposed treatment systems are presented in Attachment A.

It is the intention of HECO to remove from the unit being closed any hazardous waste and hazardous waste contaminated residue. When closure is completed, there will be no hazardous wastes left at the facilities. Therefore, a post-closure plan is not required. After closure, the three sumps will remain in service for non-hazardous wastewater handling.

SECTION 2.0

FACILITY INFORMATION

2.0 FACILITY INFORMATION

2.1 GENERAL PLANT DESCRIPTION

Hawaiian Electric Company (HECO) operates a 118 megawatt steam electric generating station (power plant) named Honolulu Generating Station. The plant occupies a 3.4 acre site on the south side of the island of Oahu on the eastern side of Honolulu Harbor. The station's boundaries are Nimitz Highway to the north, Ala Moana Boulevard to the south, and Richards and Bishop Streets to the east and west, respectively.

A map of the area from a USGS map is presented in Figure 2-1. A plot plan of the power station is shown in Figure 2-2. Table 2-1 gives the specifications for the two generating units.

2.2 FUEL SUPPLY

Low sulfur fuel oil for Honolulu Station's two boilers is delivered to the plant site via a pipeline from the supplier. Fuel oil is stored on-site in two 15,000 barrel tanks and off-site in two 80,000 barrel tanks at the nearby Iwilei storage facility. At peak load, the Honolulu plant requires 206 barrels of fuel oil per hour.

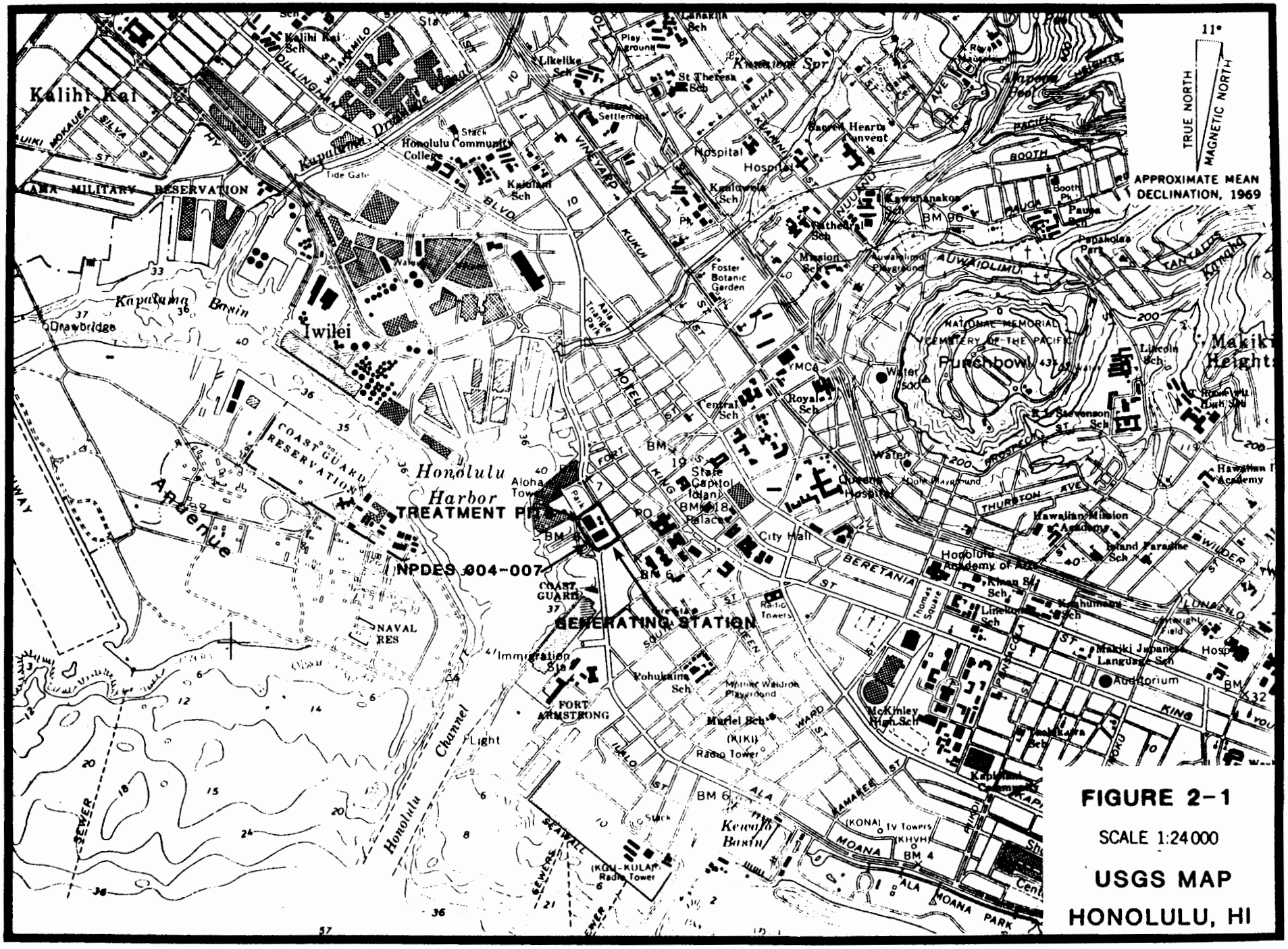


FIGURE 2-1

SCALE 1:24000

USGS MAP

HONOLULU, HI

2.3 OPERATING PERIOD

Each of Honolulu Station's two generating units normally operates 15 to 18 hours per day, 7 days per week.

2.4 WATER SUPPLY

The city water system provides potable and boiler make-up water. The condenser cooling water source is sea water from Honolulu Harbor. The discharge point is in Honolulu Harbor and is regulated by NPDES discharge permit number HI0000027.

2.5 PERSONNEL AND PAYROLL

Honolulu generating station has an operating staff of 82 persons (1984) while the total operating staff for all three HECO stations is 362 persons. The gross biweekly payroll for all three stations is $536,397.80.

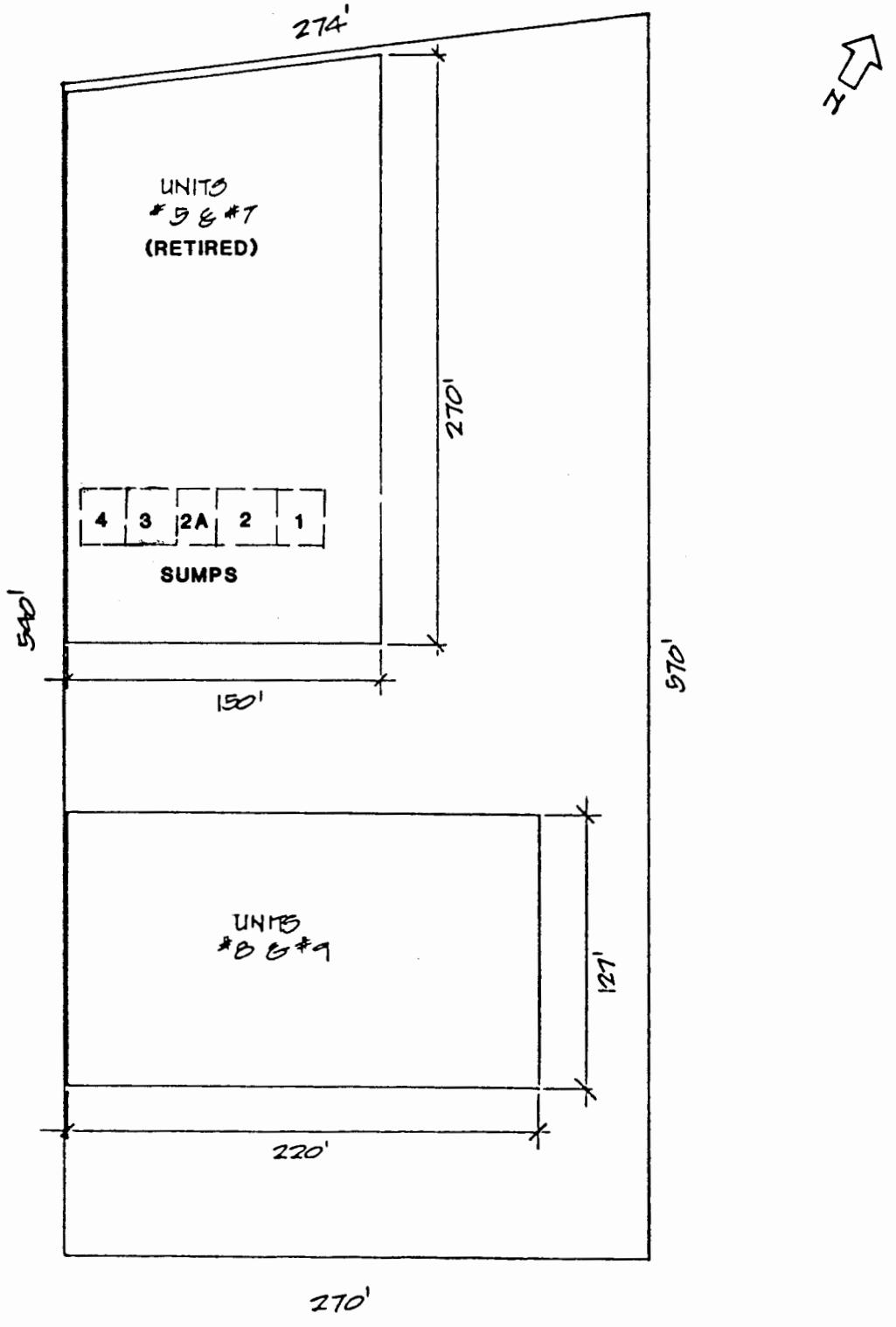


FIGURE 2-2

SCALE 1"=80'

HONOLULU GENERATING SYSTEM

TABLE 2-1

GENERATING SPECIFICATIONS
HAWAIIAN ELECTRIC COMPANY, INC.
HONOLULU GENERATING STATION

	UNIT 8	UNIT 9
HEIGHT OF BOILER BLDG.*,FT.	103'-0"	103'-0"
HEIGHT OF STACKS*, FT.	161'-6"	161'-6"
*ABOVE PLANT GROUND FLOOR		
BOILERS		
MANUFACTURER	BABCOCK & WILCOX	BABCOCK & WILCOX
STEAM TEMPERATURE, F	950	950
STEAM PRESSURE, PSIG	1315	1315
STEAM FLOW, LBM/HR	485,000	485,000
TYPE OF BURNER	MECHANICAL ATOM.	MECHANICAL ATOM.
TURBINES		
MANUFACTURER	WESTINGHOUSE	WESTINGHOUSE
NUMBER OF STAGES	32	32
THROTTLE TEMPERATURE, F	950	950
THROTTLE PRESSURE, PSIG	1250	1250
GENERATORS		
MANUFACTURER	WESTINGHOUSE	WESTINGHOUSE
GENERATING CAPACITY, KW	58,000	60,000
VOLTAGE, KV	11.5	11.5
SPEED, RPM	3600	3600
COOLING	HYDROGEN	HYDROGEN
CONDENSER		
MANUFACTURER	WESTINGHOUSE	WESTINGHOUSE
CAPACITY, GPM	59,920	59,920
COOLING SURFACE, SQ. FT.	40,000	40,000
TEMPERATURE RISE, F (OUT - IN)	10	10
COOLING WATER	SEAWATER	SEAWATER

SECTION 3.0

HAZARDOUS WASTE MANAGEMENT FACILITIES

3.0 HAZARDOUS WASTE MANAGEMENT FACILITIES

Hawaiian Electric Company has prepared this Closure Plan for the following waste management unit located at the Honolulu Generating Station. The locations of the unit is shown on Figure 2-2. Attachment C presents diagrams of the waste management unit. The unit consists of three sumps:

1. Sump #2

   - Material of Construction: Concrete
   - Dimensions: 25x32x10 feet
   - Area: 800 sq.ft.
   - Total Depth: 10 feet
   - Weir Height: 5 feet
   - Maximum Operating Capacity: 30,000 gallons
   - Waste handled in the sump:

     The sump has received waste generated by operation and maintenance activities at the power plant. These wastes are potentially corrosive and EP Toxic.

2. Sump #2A

   - Material of Construction: Concrete
   - Dimensions (average): 25x7x5 feet
   - Area: 169 sq.ft.
   - Depth: 5 feet
   - Maximum Operating Capacity: 6,300 gallons

- Waste handled in the sump:

  The sump has received waste generated by operation and maintenance activities at the power plant. These wastes are potentially corrosive and EP Toxic.

- Use and design of Sump #2A:

  Sump #2A was originally designed and functioned as an oil-water separator for sump #3. There is a weir between sumps #2A and #3. The wall between Sumps #2A and #3 is five feet high and has a hole in it, so the sumps operate essentially as one sump. The four walls of the combined #2, #2A and #3 sumps are each 10 feet high. The sumps operate with five feet of freeboard. As noted above, the average Sump #2A surface dimensions are 25 feet x 7 feet. The surface area of 169 sq. feet takes into account the space occupied by the weir and irregularities in the sump shape. See Attachment C for engineering details and piping diagrams.

3. Sump #3

- Material of Construction: Concrete
- Dimensions: 25x37x10 feet
- Area: 925 sq.ft.
- Total Depth: 10 feet
- Weir Height: 5 feet
- Maximum Operating Capacity: 35,000 gallons
- Waste handled in the sump:

  The sump has received waste generated by operation and maintenance activities at the power plant. These wastes are potentially corrosive and EP Toxic.

3.1 MAXIMUM EXTENT OF OPERATIONS

The maximum extent of operations for this hazardous waste management unit is the total surface area of the unit. The maximum extent of operations for the sumps located at the Honolulu Generating Station is as follows:

o Sump #2	25x32 feet	800 sq.ft.
o Sump #2A	25x7 feet	169 sq.ft.
o Sump #3	25x37 feet	925 sq.ft.
o Total		1,894 sq.ft.

3.2 MAXIMUM INVENTORY

The maximum inventory of the unit is the total volume of waste contained in the sumps at maximum operating capacity. The maximum inventory of the sumps is as follows:

o Sump #2	30,000 gallons
o Sump #2A	6,300 gallons
o Sump #3	35,000 gallons
o Total	71,300 gallons

3.3 WASTE STREAMS GENERATED

There are six wastewater streams generated at the Honolulu Station. The waste streams and the approximate volumes generated are listed below:

Type of Waste stream	Maximum Volume Generated
Condenser foam cleaning waste	10,000 gal/wash
Vertan 675 (boiler tube cleaning waste)	35,000 gal/cleaning (includes rinse)
Demineralizer regeneration wastes	10,000 gpd
Boiler fireside wash	100,000 gpd (for 3 days)
Air heater wash	40,000 gal/wash
Low volume wastes (non-hazardous)	60,000 gpd

3.3.1 Boiler and Condenser Tubeside Cleaning Wastewater

Waste from cleaning boiler tube inner walls and from condensers are produced infrequently, on an average of once every four years. There are two types of metal cleaning waste: (1) acid foam cleaning waste and (2) Vertan cleaning waste. These two waste streams may be corrosive or may have the characteristic of EP Toxicity for chromium and lead. This waste is collected from direct connections from the process unit. The waste is then treated in a wastewater treatment unit and discharged in compliance with NPDES permit number HI0000027.

3.3.2 Demineralizer Regeneration Waste

Demineralizer regeneration waste is produced during daily regeneration of the demineralizer ion exchange resins. The

process produces alternate acid and caustic waste streams which may have the characteristic of corrosivity. The waste is pumped to tanks where it is recirculated and, because of the alternating acid and caustic streams, is self-neutralized. The treatment tanks are part of a wastewater treatment unit.

3.3.3 Air Heater and Fireside Wash Wastewater

This waste is exempt from Federal regulation according to 40CFR261.4(b)(4). Periodic water washing of air preheaters and boiler firesides removes fly ash, slag, and corrosion products. This waste has, in the past, been treated in the sumps which are being closed. This waste has the potential to have hazardous characteristics due to pH and metal corrosion products removed in the washing process. Therefore, HECO is upgrading its wastewater treatment system to handle this waste only in tanks.

3.3.4 Low Volume Waste

Low volume waste is primarily boiler blowdown and water from building drains. This is a non-hazardous waste. It is collected in a sump, the pH is adjusted, if necessary, and the waste is discharged in compliance with NPDES permit number HI0000027.

3.4 WASTE CHARACTERISTICS

All available waste stream analyses are summarized on Table 3-1. All analyses were performed by EPA approved methods. The treated wastewater and sludges are not hazardous. During generation of some of the cleaning wastes, extractable metal concentractions are occasionally above the EP Toxicity limits.

Condenser and boiler cleaning wastes and demineralizer regeneration wastes are typically corrosive before neutralization.

The sumps contain an estimated average of 6-inches of sludge (or 10%). The sludge normally has a very high water content.

TABLE 3-1

HONOLULU POWER PLANT
WASTE STREAM ANALYSIS

	EP TOXICITY mg/l								
WASTE STREAM	As	Ba	Cd	Cr	Pb	Hg	Se	Ag	pH
Condenser Cleaning									
Unit 8, 9-25-82									
#81: 15 min.	0.20	<0.5	0.08	0.6	6.2	<0.01	<0.01	0.6	2.1
30 min.	0.27	<0.5	0.14	2.1	10.4	<0.01	<0.01	1.5	1.5
45 min.	0.22	<0.5	0.07	1.4	6.7	<0.01	<0.01	0.7	1.5
60 min.	0.40	<0.5	0.04	1.2	5.3	<0.01	<0.01	0.7	1.5
#82: 15 min.	0.37	<0.5	0.09	1.8	17.2	<0.01	<0.01	0.6	2.1
30 min.	0.57	<0.5	0.12	1.5	16.8	<0.01	<0.01	1.0	1.5
45 min.	0.25	<0.5	0.04	0.8	4.7	<0.01	<0.01	0.7	1.5
60 min.	0.28	<0.5	0.02	0.7	4.5	<0.01	<0.01	0.7	1.3
Unit 9, 9-26-82									
#91: 15 min.	0.07	<0.5	0.04	0.5	2.5	<0.01	<0.01	0.3	1.4
30 min.	0.41	<0.5	0.06	1.6	7.1	<0.01	<0.01	0.9	1.4
45 min.	0.38	<0.5	0.03	1.0	3.5	<0.01	<0.01	0.8	1.4
#92: 15 min.	0.12	<0.5	0.02	0.8	2.9	<0.01	<0.01	0.3	1.6
30 min.	0.58	<0.5	0.11	2.3	11.8	<0.01	<0.01	1.3	1.4
45 min.	0.42	<0.5	0.04	1.0	3.8	<0.01	<0.01	0.9	1.4
Sump #3									
Before Treatment:	<0.01	<0.5	0.02	0.6	0.8	<0.01	<0.01	0.4	2.7
After Treatment:	<0.01	<0.5	0.02	0.1	0.3	<0.01	<0.01	0.1	8.0
After Settling:	<0.01	<0.5	0.02	0.1	0.3	<0.01	<0.01	0.1	8.0
During Truck Loading:	<0.01	<0.5	0.02	0.2	0.4	<0.01	<0.01	0.1	8.0
Vertan 675									
2-5-73				14	5.5				9.3
9-5-84	0.05	1.0	1.0	3.5	2.6	0.005	0.017	0.07	10.0
8-28-84	0.005	<0.5	0.04	0.12	<0.1	0.001	0.001	<0.05	9.4

WASTE STREAM	EP TOXICITY mg/l As	Ba	Cd	Cr	Pb	Hg	Se	Ag	pH
Demineralizer Waste									
Unit 1, 9-14-81									
Acid Drain	<0.01	<0.5	0.05	<0.1	0.2	<0.01	<0.01	<0.1	1.1
Caustic Drain	<0.01	<0.5	0.14	0.1	0.3	<0.01	<0.01	<0.1	12.8
Unit 2, 9-17-81									
Acid Drain	<0.01	<0.5	0.06	0.1	0.2	<0.01	<0.01	<0.1	1.1
Caustic Drain	0.01	<0.5	0.14	0.1	0.2	<0.01	<0.01	<0.1	12.7
Sludge									
Sump #4, 1-31-85	0.02	0.23	<0.005	<0.01	<0.05	0.002	0.003	<0.02	6.8
Transfer Yd. Sump 1-31-85	<0.001	0.18	<0.005	<0.01	<0.05	0.002	<0.001	<0.02	6.8
Sump #2, 2-19-82	0.1	<0.5	0.01	<0.1	<0.1	<0.01	<0.01	<0.1	9.5

SECTION 4.0

CLOSURE

4.0 CLOSURE

Hawaiian Electric Company has made the decision to upgrade the current wastewater management system at the Honolulu Generating Station. After construction and start-up of new wastewater treatment facilities and closure of sumps #2, 2A, and 3, all hazardous or potentially hazardous wastes generated by the power plant will be treated in tanks to render them non-hazardous. The tanks will be part of a wastewater treatment unit which is exempt from RCRA permit requirements. The expected start-up date for the new facilities is in January of 1986. After closure, the sumps will be returned to service for handling non-hazardous wastes.

Submission of this Closure Plan for approval also constitutes notification to EPA of intent to close all Honolulu Generating Station units which have handled potentially hazardous wastes. Therefore, per 40CFR265.112(c), closure is scheduled to begin 180 days after notification of intent to close and after approval of the Closure Plan by EPA. Therefore, closure is scheduled to begin in May of 1986. Until closure begins, HECO will continue to take all steps to prevent threats to human health and the environment and will maintain current security operations.

If EPA could approve this Closure Plan and waive the 180 day notification period, closure could begin anytime after start-up of the new treatment facilities in January of 1986. HECO will notify EPA immediately if construction delays or start-up problems occur which could affect the closure date.

When the sumps have been certified closed by Hawaiian Electric Company, Inc., and by an independent registered professional engineer, and a letter is received from EPA Region IX, acknowledging that closure is complete, there will be no hazardous waste left at the sumps, and they will be returned to service for non-hazardous waste use.

Hawaiian Electric Company is basing this Closure Plan on analyses which indicate that the treated liquid and sludge contained in the sumps are not hazardous. If the results of the Sampling and Analysis Program indicate that the sumps contain hazardous waste, and the hazardous wastes and hazardous waste residues cannot be either treated or removed, this Closure Plan and closure cost estimate will be revised and resubmitted to EPA Region IX for approval.

A schedule of the following closure steps is presented in Figure 4-1.

Step 1: Notification/Submission of Closure Plan

EPA Region IX will be notified 180 days or more prior to start of closure for approval of the Closure Plan.

Step 2: Decontamination of Lines

The piping system into the three sumps which have held hazardous wastes will be flushed with plant utility water for 2 to 3 minutes. A sample of the flush water will be taken during the last 30 seconds of rinsing. The sample will be analyzed per Attachment B for pH and EP toxicity for the metals listed on Table B-1 in Attachment B. If the results indicate that the flush water is hazardous, this flushing step will be repeated until the wash water is non-hazardous. If the lines cannot be adequately flushed, they will be removed and disposed of at an EPA approved facility. If a significant amount of scale is present in the pipes, a sample of the scale will be obtained. It will be analyzed for the same constituents as the sludge. (See Step 4). If the scale is hazardous, the contaminated piping will be removed. All analysis results will be submitted to EPA.

Step 3: Sample and Analyze Liquids in the Sumps

The liquid in the sumps will be sampled and analyzed for pH and EP toxicity, per the Sampling and Analysis Plan in Attachment B, to determine if it is a hazardous waste. All analysis results will be submitted to EPA.

Step 4: Sample and Analyze Sludge in the Sumps

The sludge in the sumps will be sampled and analyzed to determine if it is a hazardous waste, per the Sampling and Analysis Plan in Attachment B. All analysis results will be submitted to EPA.

Step 5: Review the Results of Steps 3 and 4

If the liquid and sludge in the sumps are non-hazardous the sumps are closed for hazardous waste handling, they will continue in non-hazardous services. Go to Step 10 to complete closure activities.

If the liquid or sludge is hazardous, as defined in Table B-1 in Attachment B, Sampling and Analysis Plan, and by statistical analysis based on EPA SW-846, closure will continue with the following steps.

Step 6: Waste Removal

The liquid in the sumps (hazardous or non-hazardous) can be handled in one of two ways. The liquid waste can be treated at the on-site wastewater treatment unit and be discharged in compliance with the facility's NPDES discharge permit. If, because of volume or level of contaminants, it cannot be adequately treated on-site, it will be treated or disposed of at an approved off-site facility. Non-hazardous waste can be shipped to HECO's Kahe Generating Station for treatment. Hazardous liquids will be collected by a licensed hazardous-waste transporter for disposal at a licensed hazardous waste disposal facility. Transportation and disposal of any hazardous waste will be tracked by a Uniform Hazardous Waste Manifest.

If the sludge in the sumps is non-hazardous, it will be removed by vacuum truck and disposed of in an environmentally acceptable manner. If the sludge is hazardous, it will be collected by a licensed hazardous waste transporter for disposal at an approved hazardous waste disposal facility. Transportation and disposal will be tracked by a Uniform Hazardous Waste Manifest.

Step 7: Decontamination of Concrete

If the sludge or liquid is hazardous, the sumps will be cleaned after removal of all waste in the sumps. The interior of each sump will be thoroughly cleaned by either hydroblasting or steam cleaning. All workers will wear protective clothing.

All washing residue will be contained in the sumps. It will then be removed and handled as a hazardous waste. It may be treated on-site at the wastewater treatment unit and discharged in compliance with the NPDES permit. Alternately, it can be collected by a licensed transporter for disposal at an approved hazardous waste facility. Transportation and disposal will be tracked by a Uniform Hazardous Waste Manifest.

Step 8: Sample, Analyze, and Inspect Concrete

The concrete in the sides and bottom of each sump will be sampled and analyzed to determine if it is contaminated with hazardous constituents. The sampling and analysis will be accomplished as described in Attachment B, Sampling and Analysis Plan. The concrete will be analyzed for pH and the EP toxicity constituents on Table B-1 in Attachment B. All analysis results will be submitted to EPA.

After cleaning, the concrete in each sump will be thoroughly inspected, once, by an independent professional engineer for pitting or cracking which might have allowed leakage.

Step 9: Review of Concrete Analysis and Inspection

If the results of the concrete analyses determine that the concrete is not hazardous, the sumps are considered closed for hazardous waste handling. The sump will continue in non-hazardous service. Step 10 will complete closure activities.

If the results of the concrete analyses indicate that the concrete is contaminated with hazardous waste constituents based on the levels on Table B-1 and by statistical analysis per EPA SW-846, closure activities will cease. The Closure Plan will be revised to allow HECO to investigate the extent of contamination and to determine the most appropriate closure procedures. Disposal closure will be considered as an option if the sump cannot be decontaminated. The sumps are an integral part of the building structure and cannot be removed. Based on recent test results of the sump

contents, it is unlikely that the concrete will be contaminatd. However, if it should occur, a revised closure plan will be submitted to EPA for approval.

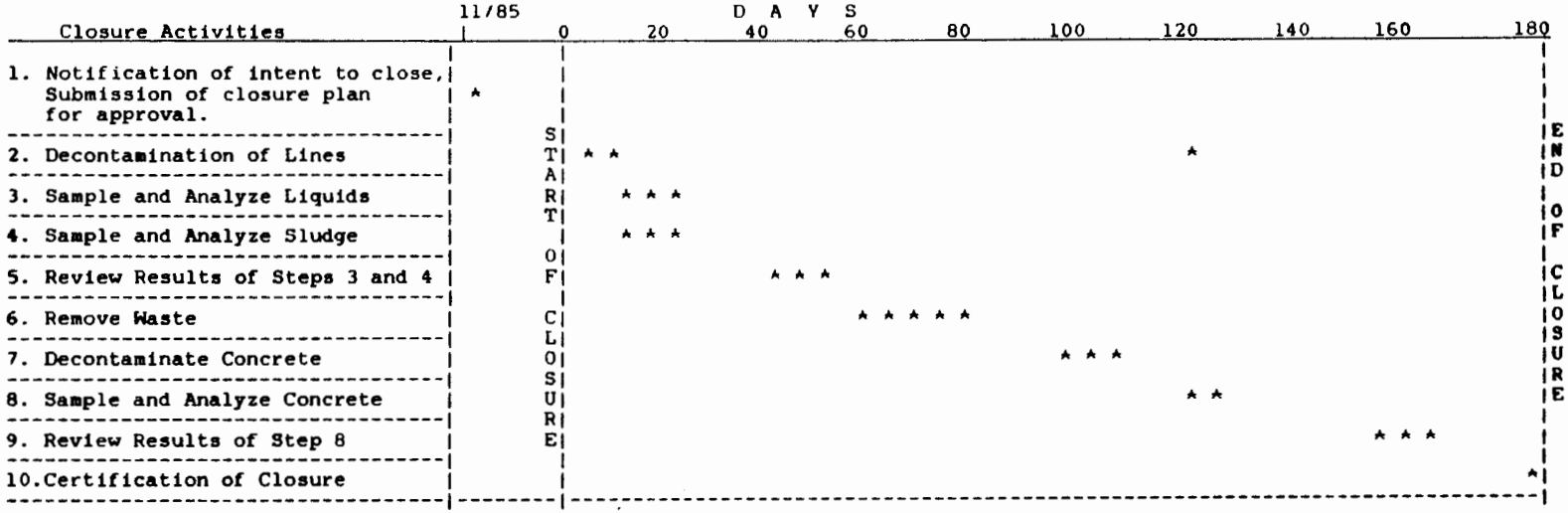
If inspection of the concrete reveals structural damage which could have allowed leakage, a revised Closure Plan will be submitted. The revised closure plan will include procedures to determine the extent of any contamination which might have occurred.

Step 10: Certification of Closure

When closure is completed, HECO will submit a certification of closure activities to EPA Region IX. An independent professional engineer registered in Hawaii and an engineer from Hawaiian Electric Company will inspect the sumps after completion of all closure steps. They will certify that the sumps have been closed in accordance with all applicable steps in the approved Closure Plan.

FIGURE 4.1

HONOLULU CLOSURE SCHEDULE



SECTION 5.0

DECONTAMINATION

5.0 DECONTAMINATION

5.1 DECONTAMINATION OF EQUIPMENT

The following decontamination procedures will be followed if any hazardous wastes are found.

All equipment, such as piping, trucks, samplers, trowels, and shovels used during closure will be cleaned before leaving the site or before re-use. A steam cleaner or water spray will be used to remove liquid and solid residue, since the water, sludge, or concrete is not expected to adhere strongly to the equipment. Cleaning of the equipment used at the site will take place either into a 55-gallon drum, back into the sumps, or on a waterproof tarp. The tarp will be placed on a graded area so that all liquid and residue can be contained and collected.

5.2 DECONTAMINATION RESIDUES

Decontamination residues, including washwater, will be treated in tanks at the on-site wastewater treatment unit and discharged in accordance with the facility's NPDES Discharge Permit number HI0000027. If, because of volume or concentration, the waste would exceed NPDES limits, the waste will be shipped off-site to HECO's Kahe or Waiau facility. If any sludge or

liquid is determined to be hazardous during closure, the tarp will be considered hazardous and will be transported to an off-site hazardous waste disposal facility by a registered transporter under a Uniform Hazardous Waste Manifest for disposal. If the sludges and wastewater are non-hazardous, the tarp will be washed with water. The washwater will be handled as a decontamination residue. The tarp will be disposed of in an environmentally sound manner.

SECTION 6.0

SAMPLE CONTROL

6.0 SAMPLE CONTROL

The closure procedures will require samples of liquid, sludge and concrete to be taken and analyzed. All samples will be labeled and sealed to prevent contamination of, or tampering with, the samples.

To establish the documentation necessary to trace sample possession from the time of custody, a chain of custody record will be filled out and will accompany every set of samples. An example of a chain of custody record is illustrated in Figure 6-1.

The laboratory will conduct established quality control procedures throughout the analyses. This will include blanks, spikes, internal standards, and duplicate samples. This information will be available for each sample set.

Further details are presented in the Sampling and Analysis Program in Attachment B.

MITTELHAUSER corporation

22691 LAMBERT STREET • SUITE 506 • EL TORO, CA 92630

FIGURE 6-1

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME					NO. OF CONTAINERS								REMARKS
SAMPLERS: *(Signature)*														
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION									

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

MITTELHAUSER corporation

SAMPLING ANALYSIS REQUEST

PART I: Field Section

Collector _____ Date Sampled _____ Time _____ hours

Affiliation of Sampler _____

Address _____
number street city state zip

Telephone (___)_____ Company Contact _____

LABORATORY SAMPLE NUMBER	COLLECTOR'S SAMPLE NO.	TYPE OF SAMPLE*	FIELD INFORMATION**

Analysis Requested _____

Special Handling and/or Storage _____

PART II: LABORATORY SECTION**

Received by _____ Title _____ Date _____

Analysis Required _____

* Indicate whether sample is soil, sludge, etc.
**Use back of page for additional information relative to sample location.

FIGURE 6.2

SECTION 7.0

CLOSURE COST ESTIMATE

7.0 CLOSURE COST ESTIMATE

Closure costs for the three sumps are summarized on Table 7-1. Recent analysis of the sump liquids and sludges conducted by approved test methods have demonstrated that the wastes do not exhibit the EP Toxicity or corrosivity characteristics. Therefore, this closure cost estimate summarizes the costs for sampling and analyzing liquids and sludges and treating the wastes in tanks at the on-site wastewater treatment unit and discharging the waste under NPDES permit number HI0000027.

Attachment D is a copy of HECO's financial assurance for the Kahe and Waiau facilities. This assurance is presently being revised to include the Honolulu facility.

TABLE 7-1

SUMMARY OF CLOSURE COSTS FOR HONOLULU GENERATING STATION

Step	Description	Cost
1	Notify EPA of Closure	N/C
2	Decontaminate lines	1,000
3	Sample and analyze liquid Sampling: 16 hrs @ $50/hr Analysis: 6 samples @ $400 ea	3,200
4	Sample and analyze sludge Sampling: 32 hrs @ $50/hr Analysis: 6 samples @ $450 ea	4,300
5	Review results of steps 3,4	3,000
6	Waste removal 37 cubic yards @ $100/cu yd	3,700
7	Decontaminate concrete surface	1,500
8	Sample and analyze concrete Sampling: 16 hrs @ $100/hr Analysis: 12 samples @ $450 ea	7,000
9	Review of step 8	2,000
10	Certification of closure PE: 20 hrs @100/hr. Expenses: $1000.	3,000
-	Project management	3,000
	TOTAL ESTIMATE	31,700

SECTION 8.0

POST-CLOSURE PLAN

8.0 POST-CLOSURE PLAN

A post-closure plan is not required at the Honolulu Station. The closure plan is based on the assumption that no hazardous wastes or hazardous waste residue will be left in place within the sumps at the Honolulu Station. If, during closure, the results of the sampling and analysis program indicate that the sump contents and concrete are hazardous, a revised closure plan and post-closure plan will be submitted to EPA for approval.

ATTACHMENT A

WASTEWATER TREATMENT SYSTEM

DESCRIPTION OF EXISTING SYSTEM

The existing wastewater treatment system consists of two 32,000 gallon steel tanks (Tanks No. 5 and 7), a large concrete basin divided into four holding sumps, transfer and recirculation pumps, a chemical feed system, and various instrumentation. Wastewater from the plant is collected and pumped to the appropriate tank or sump for processing. These wastewater streams include boiler and condenser tubeside cleaning wastewater, demineralizer regeneration wastewater, boiler blowdown waste (Low Volume Waste), and boiler and air heater fireside wash wastewater.

A. Boiler and Condenser Tubeside Cleaning Wastewater

This wastewater is collected from direct connections to the boiler or condenser and drained into a surge tank. The wastewater is pumped to Tank No. 7, located above the concrete sumps. Caustic and flocculant are introduced into the tank to precipitate the dissolved solids. After settling of the solids in the tank, the supernatant is drained into the concrete holding sump No. 2 for further treatment. The settled solids are drained into the concrete holding sump No. 3 for later transport via tank truck to the Kahe Power Plant. Final treatment is completed at Kahe.

B. Demineralizer Regeneration Wastewater

This wastewater stream is pumped to Tank No. 5. The alternating acid and caustic waste streams produced during regeneration of the demineralizer ion exchange resins result in a wastewater that neutralizes itself after a period of recirculation. After neutralization, the wastewater is drained to sump No. 2 for settling of the suspended solids. After settling, the clear supernatant is transferred to sump No. 1 for final pH adjustment and subsequent overboarding into the discharge tunnel. The settled solids are periodically removed and transported to Kahe for disposal.

C. Low Volume Wastewater

Non-hazardous low volume wastewater, which is primarily boiler blowdown, drains from the atmospheric blowoff tanks into the building drain system. The building drain system empties into a concrete sump in the station switchyard. Sump pumps deliver the wastewater to the concrete holding sumps No. 1, 2, or 3. The pH is adjusted prior to overboarding.

D. Fireside Wash Wastewater

This wastewater stream is carried by concrete trenches inside of the plant to concrete catch basins outside of the building. Piping from the catch basins carry the wastewater to the sump

in the switchyard. The sump pumps deliver the water to the concrete holding sump Nos. 2 or 3. During this period, the neutralized demineralizer wastewater is diverted to sump No. 1. The fireside wash wastewater is later pumped to tanker trucks which deliver it to the Kahe Power Plant for final treatment.

E. Overboarding

Concrete holding sump No. 1 is made up of the solids separator compartment and the oil separator compartment. Heavy particles will settle and collect in the bottom of the first compartment and liquids will overflow through a weir to enter the second compartment. In the first compartment, the lighter oils present in the wastewater will float on the surface and will be removed by a conveyor belt skimmer system. A submerged type pH probe is installed in the first compartment to monitor the input wastewater for the purpose of controlling the acid treatment operation. At the bottom of the second compartment, a 10-inch pipeline allows the flow of oil-free water directly into sump No. 4.

Sump No. 4 is where the final wastewater condition is monitored prior to its being overboarded into the discharge tunnel. Another submerged type pH probe, water level switches, and the wastewater recirculation pump and overboard pump are located at this sump.

When the inlet wastewater to sump No. 1 approaches the maximum allowable pH of 9.0, the wastewater recirculation pump and the acid feed pump are turned on manually. The recirculation pump draws suction from sump No. 4 and discharges the water back to the plant wastewater line going into sump No. 1. The acid feed pump will inject acid into the plant wastewater line at a point near the exit nozzle to sump No. 1. Good mixing of acid and wastewater is achieved by the agitating action of the high flow water entry into the sump. When a reduced pH reading of the sump water is monitored, both the recirculation pump and the acid feed pump are shut down.

The wastewater overboard pump operation is controlled by a water level switch and the pH reading in sump No. 4. When high water level is reached and pH is detected to be in the safe range of 6.0 to 9.0, the overboard pump is turned on automatically and its discharge is piped into the circulating water discharge tunnel. A shutoff control valve and an integrating flow meter are installed in the wastewater overboard line. The controlling variable for opening and closing the overboard shutoff control valve is the pH reading in sump No. 4. This pneumatic operated valve can be opened only when the wastewater is within the acceptable safe pH range of 6.0 to 9.0. If the pH should shift out of safe range

during overboarding, the overboard shutoff control valve will trip closed and simultaneously the overboard pump will automatically shut down.

F. Sump Cleaning

Sump cleaning involves the removal of liquid effluents and sludge deposits. Non-hazardous liquid effluents are discharged in compliance with NPDES requirements or are pumped into tanker trucks and hauled to HECO's Kahe plant for final treatment and disposal. Sludge removal involves: a) the use of a high pressure air lance to suspend the sludge matter into a slurry, and b) the pumping of this sludge slurry into tanker trucks for transport to Kahe for treatment and disposal.

Sludge is removed from each sump on an average of once a year.

DESCRIPTION OF NEW SYSTEM
(From HECO Specification Number 8340-CONST-1)

I. PROJECT DESCRIPTION

The present wastewater system will be modified and repaired to allow proper collection, treatment and disposal of all of the plant wastewater streams. These include boiler and condenser tubeside cleaning wastewater, demineralizer regeneration wastewater, boiler blowdown waste (Low Volume Waste), and boiler and air heater fireside wash wastewater.

A. Boiler and Condenser Tubeside Cleaning Wastewater
Treatment is done in the existing 32,000 gallon tank No. 7. Provisions will be made to transfer the supernatant from tank No. 7 to tank No. 5 for further treatment.

B. Demineralizer Regeneration Wastewater
Presently, this wastewater is delivered to the existing 32,000 gallon tank No. 5, where it is neutralized then drained into sump No. 2. Because this tank must now be used for fireside wastewater treatment, a new 12,000 gallon tank will be installed on the operating floor to collect and neutralize the demineralizer waste.

C. Low Volume Waste
The boiler blowdowns and heater, turbine and miscellaneous drains are piped to atmospheric blowoff tanks. The condensate flows from the tanks to the plant floor drains which carry the water to the switchyard sump. The sump pumps are designed to deliver this water to sump No. 1, 2 or 3 for proper treatment, if required, and disposal. A new disposal system consisting of standpipes and pumps will be installed to handle this wastewater stream and keep it separate from the fireside wash.

D. Fireside Wash Wastewater
On Unit 8, during boiler and air heater washing, the wastewater falls to the floor and flows to existing drainage trenches. These trenches carry the wastewater to the existing catch basin outside of the plant. On Unit 9, temporary piping connected to the boiler and air heater wash drain connections carries the wastewater to the catch basin. The catch basin piping, which also collects rainwater runoff, drains into the switchyard sump. The sump pumps deliver the wastewater to sump No. 2 or 3. However, because sump Nos. 2 and 3 do not meet EPA's definition of a tank, they can no longer be used to collect this hazardous waste. Therefore, tank Nos. 5 and 7 will be used to collect and treat fireside wash, and the piping system will be modified accordingly. Provisions will be provided to inject caustic, polymer or acid into the

recirculation line to allow complete treatment if desired. The treated, non-hazardous effluent will be drained into sump No. 2 or 3 for subsequent trucking to Kahe or Waiau.

In addition, new temporary piping must be provided from the boiler and air heater wash drains of Unit 8 to the catch basin to prevent potentially hazardous waste from falling to the floor.

II. SYSTEM OPERATION

The following sections outline the procedure for treatment of each of the wastewater streams.

A. Boiler and Condenser Tubeside Cleaning Wastewater

1. The tubeside wastewater will be drained into the 1500 gallon surge tank. Transfer Pump No. 5 will deliver the water to tank No. 7.

2. Caustic and flocculant will be introduced into the wastewater, and the solution will be recirculated to precipitate the dissolved solids. The precipitated solids will be allowed to settle in the tank.

3. The supernatant will be transferred to tank No. 5 via the tank No. 7 drain connection located at the manhole. Recirculation Pump No. 2 will deliver the supernatant to tank No. 5. After draining of the supernatant, the settled sludge in tank No. 7 will be drained into sump No. 2 or 3.

4. The supernatant in tank No. 5 will be recirculated and acid will be introduced in order to reduce the pH. The supernatant will then be drained into sump No. 1.

5. Existing automatic controls will recirculate the wastewater between sump Nos. 1 and 4 and introduce acid as necessary to reduce the pH to between 6 and 9.

6. Existing automatic controls will overboard the non-hazardous wastewater as described in Section F below.

B. Demineralizer Regeneration Wastewater

1. The demineralizer regeneration cycle is started manually. Alternating acid and caustic wastewater streams are produced during regeneration. The wastewater will flow by gravity to a 260 gallon surge tank.

Pumps controlled by the level in the surge tank will deliver the water to the new 12,000 gallon storage tank on the operating floor. After the regeneration cycle is complete (about 4 hours), the wastewater in the tank must be recirculated to thoroughly mix the acid and caustic streams thereby neutralizing the wastewater.

2. Because of the limited tank storage capacity, the next regeneration cycle cannot be started while the demineralizer wastewater from the first cycle is being recirculated.

3. The neutralized wastewater will be drained into sump No. 2 for settling of the suspended solids. The pH must be between 2 and 12 prior to draining. The pH is monitored manually and can be adjusted manually through injection ports in the tank.

4. Transfer Pump No. 4 will deliver the supernatant from sump No. 2 to sump No. 1. Existing automatic controls will adjust the pH as described in Section A-5 above.

5. The settled sludge from the bottom of sump No. 2 must be periodically transferred to sump No. 3 for subsequent trucking to Kahe or Waiau.

C. Low Volume Wastewater

1. The low volume wastewater, which is primarily boiler blowdown, will be drained from the atmospheric blowoff tank to a standpipe. A pump controlled by the level in the standpipe will take suction from the standpipe and deliver the wastewater to sump No. 1.

2. Minimal treatment is required for this non-hazardous waste stream. It will be overboarded after pH adjustment.

D. Fireside Wash Wastewater

1. Temporary piping connected to the air heater and boiler fireside wash drains will carry the wash wastewater to a catch basin on the north side of the Plant. The catch basin drain system will carry the wastewater to the sump in the switchyard. Sump pumps will deliver the water to tank Nos. 5 and 7.

2. Caustic will be introduced into the wastewater, which will be recirculated within the 32,000 gallon tanks, to aid in the precipitation of the metal cleaning wastes out of solution. After raising the pH to between 10 and 11.5, the

wastewater will be continuously recirculated within the tank for 4 hours to ensure the precipitation process is carried to completion, thus rendering it non-hazardous. The non-hazardous waste will be drained into sump No. 2 or 3 for subsequent trucking to Kahe or Waiau.

3. The existing flow meter and strainer will be relocated to allow metering of the wastewater volume which will be drained from either tank No. 5 or No. 7 into sump No. 2 or 3, or directly to the trucks.

E. Boiler Draining

After shutdown and cooling of the boiler, the boiler water will be drained into the 1500 gallon surge tank, then pumped to sump No. 1,2 or 3. Little or no treatment is required. The tank and piping must first be flushed to clear out residue from the tubeside cleaning wastewater.

F. Overboarding

The existing normal overboard Pump No. 3 will take suction from sump No. 4, pump the wastewater through the DynaSand filter for final clarification, then discharge into a clean effluent holding tank. A new overboard pump controlled by the level in the holding tank will discharge through an existing displacement meter to the Honolulu Unit 8 and 9 condenser discharge tunnel.

The existing normal overboard pump is controlled by the sump water level and a pH monitor in the sump. A high water level and normal pH reading between 6 and 9 will start the pump. A low sump level or pH readings greater than 9 or less than 6 will stop the pump.

G. Sump Cleaning

Sump cleaning involves the removal of liquid effluents and sludge deposits. Non-hazardous liquid effluents are discharged in compliance with NPDES requirements or are pumped into tanker trucks and hauled to HECO's Kahe plant for final treatment and disposal. Sludge removal involves: a) the use of a high pressure air lance to suspend the sludge matter into a slurry, and b) the pumping of this sludge slurry into tanker trucks for transport to Kahe for treatment and disposal.

Sludge is removed from each sump on an average of once a year.

ATTACHMENT B

SAMPLING AND ANALYSIS PLAN

ATTACHMENT B

SAMPLING AND ANALYSIS PLAN

INTRODUCTION

Honolulu Generating Station is closing three sumps which have handled potentially hazardous waste. A sampling and analysis program will be performed to characterize the liquid, sludge and, if necessary, concrete in each sump. The results of this program will establish the method of closure and the quantity of material (if any) to be removed.

LIQUID IN THE SUMPS

The surface area of each sump will be divided into half. One grab sample from each half will be taken and analyzed. The two samples will be representative of the sump from which they were taken.

A coliwasa or equivalent will be used to obtain the liquid samples. If the waste is stratified, a sample will be obtained from each layer. The sampling device will be rinsed after each sampling with distilled water, and the rinse water will be placed in the pond.

Each grab sample will be transferred to a sample bottle prepared prior to sampling by the analytical laboratory with the correct preservative per EPA Publication SW-846. Each sample bottle will be labeled with a waterproof marker prior to filling the bottle.

The waste streams discharged to the sumps were potentially hazardous for the characteristics of corrosivity and EP Toxicity for metals. Therefore, these liquid samples will be analyzed for pH and for trace quantities of the following metals: arsenic, barium, cadmium, chromium, lead, selenium, silver and mercury. The methodology and concentration limits for these constituents are shown in Table B-1.

SLUDGE IN THE SUMPS

At each of the sumps, the surface area will be divided into half. A sample of sludge will be obtained from each half of the sump for analysis. The two sludge samples will be representative of each sump. If the waste is stratified, a sample will be obtained from each layer.

The sludge samples will be obtained using a weighted bottle sampler, dipper, coliwasa or equivalent. The sampler will be rinsed with distilled water prior to sampling, and the rinse water and residues will be placed back into the sump.

The containers for each composite sample will be either wide-mouthed glass jars covered with a Teflon-lined screw cap or zip-lock bags. A minimum of 200 grams will be collected for each sample.

Sludge samples will be tested for pH and the EP Toxicity characteristic. The parameters, concentration limits and methodology are shown on Table B-1.

CONCRETE AT THE SUMPS

Samples of the concrete will be taken for analysis only if the liquid or sludge samples are determined to have hazardous metallic concentrations. After all hazardous waste has been removed from the sump, the concrete washed, and the wash water removed, the surface area of the sump will be divided into quadrants and a composite sample will be taken from each quadrant. Samples will be chipped from six random locations in each quadrant (including the walls) using a hammer and chisel. The chips will then be combined to provide one sample for each quadrant. One additional sample of concrete will be obtained from the sump in an area which has not been in contact with the liquid waste. This will establish a background level for metallic concentrations in the concrete.

Each sample of approximately 500 grams will be placed in wide-mouthed glass jars or polyethylene bags (or equivalent).

The concrete samples will be analyzed for the same characteristics as the sludge: EP Toxicity characteristic for metals (arsenic, barium, cadmium, chromium, lead, selenium, silver and mercury) and for pH. The results of these analyses will allow the Honolulu Generating Station staff to determine if the concrete is contaminated with hazardous waste. The methodology and concentration limits for these constituents are shown on Table B-1.

SAMPLE CONTROL

Each sample container will be labeled with the following information at the time of sampling:

- Sample Number
- Sample Location
- Waste Type
- Date of Sample
- Time of Sample
- Name of Sampler

Seals will be applied to each container immediately after collection to prevent tampering with the samples. The seals will display the following information:

- Sample Number
- Date of Sample
- Collector's Name

One blank sample will be prepared on-site on each day of sampling. The blank will be distilled water transferred to a sample bottle at the site. The samples will be placed in a container and packed in ice. They will then be sent to the laboratory. The Chain of Custody procedures that are described in EPA SW-846 will be followed.

The information pertinent to sampling the liquid, sludge and concrete in the sumps will be recorded in a hard bound log book. Entries in the log book will include the following information:

- Purpose of sampling
- Description of sampling point
- Field contact
- Type of waste sampled
- Description of sampling methodology
- Depth of liquid or sludge at time of sampling
- Depth of sample
- Date and time of collection
- Weather at time of collection
- Field measurements
- Photos, if taken
- Signature of personnel responsible for sampling
- Field observations
- Number and volume of samples
- Sample distribution
- Transportation

TABLE B-1

EXTRACTION PROCEDURE LIMITS AND METHODOLOGY

Constituent	Method[1]	EP Toxicity Limit Milligrams/liter (mg/1)
Arsenic	7060 or 7061	5.0
Barium	7080 or 7081	100.0
Cadmium	7130 or 7131	1.0
Chromium	7190 or 7191	5.0
Lead	7420 or 7421	5.0
Mercury	7470	0.2
Selenium	7740 or 7741	1.0
Silver	7760 or 7761	5.0
pH[2]	9040	-

The method for the Extraction Procedure is 1310 from EPA SW-846.

1. All methods are from EPA SW-846, "Test Methods for Evaluating Solid Waste".
2. pH must be greater than 2.0 and less than 12.5.

ATTACHMENT C

SUMP DIAGRAMS

ATTACHMENT D

FINANCIAL ASSURANCE

HAWAIIAN ELECTRIC COMPANY, INC. · PO BOX 2750 · HONOLULU, HI 96840-0001

May 07, 1986

Ms. Judith E. Ayres
Regional Administrator
Environmental Protection Agency
215 Fremont Street
San Francisco, California 94105

Dear Ms. Ayres:

Enclosed is the documentation necessary for Hawaiian Electric Company (HECO) to comply with the annual EPA financial liability requirements for sudden and non-sudden accidental pollution and closure care. The financial test has been used to demonstrate liability for the $10,605,000 annual aggregate.

Provided for compliance is the following:

1) A letter from Hawaiian Electric's Chief Financial Officer and Controller, Mr. Paul Oyer, stating compliance with the liability and closure/post closure requirements enabling Hawaiian Electric Company to demonstrate financial capability.

2) A letter from Peat, Marwick, Mitchell and Company to the Board of Directors of Hawaiian Electric Company stating that the related statements evidenced in the financial test are derived from their independently audited, year-end financial statements, in accordance with generally accepted accounting principles (Exhibit A).

3) A copy of the opinion on Hawaiian Electric Company's consolidated financial statements from our independent certified accountants dated February 11, 1986 (Exhibit B).

4) A copy of Hawaiian Electric Company's consolidated financial statements as of December 31, 1985, opined on by Peat, Marwick, Mitchell, and Company (Exhibit C).

With these submittals, Hawaiian Electric Company will be in compliance with the Environmental Protection Agency's standards applicable to owners and operators of hazardous waste treatment, storage, and disposal facilities to date.

Sincerely,

Susan R. Welch

Susan R. Welch
Director, Insurance & Claims

SRW:JFM:jmm

Enclosures

cc: B. Munger - HECO
D. Fukuda - HECO

HEI

HAWAIIAN ELECTRIC COMPANY, INC. · PO BOX 2750 · HONOLULU, HI 96840-0001

Paul A. Oyer
Financial Vice President and Controller

May 08, 1986

Letter from the Chief Financial Officer to Demonstrate Liability Coverage and Assurance of Closure Care

Ms. Judith E. Ayres
Regional Administrator
Environmental Protection Agency
215 Fremont Street
San Francisco, California 94105

Dear Ms. Ayres:

I am the Chief Financial Officer of Hawaiian Electric Company, Inc., P. O. Box 2750, Honolulu, Hawaii 96840-0001. This letter is in support of this firm's use of the financial test to demonstrate financial responsibility for liability coverage and closure and/or post closure care as specified in Subpart H of 40 CFR Parts 264 and 265.

The owner or operator indentified above owns or operates the following facilities for which liability coverage is being demonstrated through the financial test specified in Subpart H of 40 CFR Parts 264 and 265.

Facility

HIT 000 610923
Kahe Generating Station (HECO)
P. O. Box 2750
Honolulu, Hawaii 96840-0001

HIT 000 610873
Waiau Generating Station (HECO)
P. O. Box 2750
Honolulu, Hawaii 96840-0001

HID 000 150680
Honolulu Generating Station (HECO)
P. O. Box 2750
Honolulu, Hawaii 96840-0001

1) The owner or operator identified above owns or operates the following facilities for which financial assurance and closure or post closure care is demonstrated through the financial test specified in Subpart H of 40 CFR Parts 264 and 265. The current closure and/or post closure cost estimates covered by the test are shown for each facility:

Facility	1986 Closure Costs
HIT 000 610923 Kahe Generating Station (HECO) P. O. Box 2750 Honolulu, Hawaii 96840-0001	$1,400,000
HIT 000 610873 Waiau Generating Station (HECO) P. O. Box 2750 Honolulu, Hawaii 96840-0001	$1,140,000
HID 000 150680 Honolulu Generating Station (HECO) P. O. Box 2750 Honolulu, Hawaii 96840-0001	$ 65,000

2) The owner or operator identified above guarantees, through the corporate guarantee specified in Subpart H of 40 CFR Parts 264 and 265, the closure and post closure care of the following facilities owned or operated by its subsidiaries. The current cost estimates for the closure or post closure care so guaranteed are shown for each facility: None .

3) In States where EPA is not administering the financial requirements of Subpart H of 40 CFR Parts 264 or 265, this owner or operator is demonstrating financial assurance for the closure or post closure care of the following facilities through the use of a test equivalent or substantially equivalent to the financial test specified in Subpart H of 40 CFR Parts 264 and 265. The current closure and/or post closure cost estimates covered by such a test are shown for each facility: None .

HEI

4) The owner or operator identified above owns or operates the following hazardous waste management facilities for which financial assurance for closure or, if a disposal facility, post closure care is not demonstrated either to EPA or a State through the financial test or any other financial assurance mechanism specified in Subpart H of 40 CFR Parts 264 and 265 or equivalent or substantially equivalent State mechanisms. The current closure and/or post closure cost estimates not covered by such financial assurance are shown for each facility: None .

This owner or operator is required to file a Form 10K with the Securities and Exchange Commission (SEC) for the latest fiscal year.

The fiscal year of this firm ends on December 31. The figures for the following items marked with an asterisk are derived from this firm's independently audited, year-end financial statements for the latest completed fiscal year ended December 31, 1985.

PART B. Closure or Post Closure Care and Liability

ALTERNATIVE II

1.	Sum of current closure and post closure cost estimates (total of all cost estimates listed above).	$ 2,605,000
2.	Amount of annual aggregate liability coverage to be demonstrated.	$ 8,000,000
3.	Sum of lines 1 and 2.	$10,605,000
4.	Current bond rating of most recent issuance and name of rating service.	A+ Standard and Poor's Corp.
5.	Date of issuance of bond.	January 13, 1982
6.	Date of maturity of bond.	December 01, 1991

HEI

* 7.	Tangible net worth (if any portion of the closure or post closure cost estimates is included in "total liabilities" or your financial statements you may add that portion to this line).	$251,895,000
* 8.	Total assets in the U. S. (required only if less than 90% of assets are located in the U. S.).	N/A

		YES	NO
9.	Is line 7 at least $10 million?	X	
10.	Is line 7 at least 6 times line 3?	X	
* 11.	Are at least 90% of firm's assets located in the U. S.? If not, complete line 12.	X	
12.	Is line 8 at least 6 times line 3?	N/A	

I hereby certify that the wording of this letter is identical to the wording specified in 40 CFR 264.151 (g) as such regulations were constituted on the date shown immediately above.

Paul Oyer
Financial Vice President
and Controller
May 08, 1986

HEI

EXHIBIT A

Peat, Marwick, Mitchell & Co.
Certified Public Accountants
Financial Plaza Of The Pacific
P.O. Box 4150
Honolulu, Hawaii 96813
808-531-7286

May 8, 1986

The Board of Directors
Hawaiian Electric Company, Inc.
P. O. Box 2750
Honolulu, Hawaii 96840

Dear Sirs:

We have examined the consolidated balance sheet and consolidated statement of capitalization of Hawaiian Electric Company, Inc. and subsidiaries as of December 31, 1985 and the related consolidated statements of income, retained earnings and sources of funds for construction for the year then ended and have issued our report thereon dated February 11, 1986. Our examination was made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the aforementioned consolidated financial statements present fairly the financial position of Hawaiian Electric Company, Inc. and subsidiaries at December 31, 1985 and the results of their operations and the sources of funds for construction for the year then ended, in conformity with generally accepted accounting principles applied on a consistent basis.

The accompanying letter from the Company specifies certain data as having been derived from the aforementioned financial statements. We have (1) compared the dollar amounts of Common Stock Equity and Other Assets (Intangible Assets) at December 31, 1985 as set forth in the Company's Schedule of Tangible Net Worth to the aforementioned financial statements and found them to be in agreement and (2) recomputed the Tangible Net Worth and found it to be mathematically correct.

Nothing came to our attention as a result of the foregoing procedures that caused us to believe that the specified data should be adjusted. The foregoing procedure does not constitute an examination in accordance with generally accepted auditing standards.

Very truly yours,

Peat, Marwick, Mitchell & Co.

EXHIBIT B

Peat, Marwick, Mitchell & Co.
Certified Public Accountants
Financial Plaza Of The Pacific
P.O. Box 4150
Honolulu, Hawaii 96813

The Board of Directors and Shareholder
Hawaiian Electric Company, Inc.:

We have examined the consolidated balance sheets and consolidated statements of capitalization of Hawaiian Electric Company, Inc. (a wholly owned subsidiary of Hawaiian Electric Industries, Inc.) and subsidiaries as of December 31, 1985, 1984 and 1983 and the related consolidated statements of income and retained earnings and sources of funds for construction for the years then ended. Our examinations were made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the aforementioned consolidated financial statements present fairly the financial position of Hawaiian Electric Company, Inc. and subsidiaries at December 31, 1985, 1984 and 1983, and the results of their operations and changes in their financial position for the years then ended, in conformity with generally accepted accounting principles applied on a consistent basis.

Our examinations were made for the purpose of forming an opinion on the consolidated financial statements taken as a whole. The consolidating information is presented for purposes of additional analysis of the consolidated financial statements rather than to present the financial position, results of operations, and changes in financial position of the individual companies. The consolidating information has been subjected to the auditing procedures applied in the examinations of the consolidated financial statements and, in our opinion, is fairly stated in all material respects in relation to the consolidated financial statements taken as a whole.

Peat, Marwick, Mitchell & Co.

February 11, 1986

PEAT MARWICK

EXHIBIT C

HAWAIIAN ELECTRIC COMPANY, INC.
(A Wholly Owned Subsidiary of
Hawaiian Electric Industries, Inc.)
AND SUBSIDIARIES

Consolidated Financial Statements
and Consolidating Schedules

December 31, 1985, 1984 and 1983

(With Audit Report Thereon)

EXHIBIT C

HAWAIIAN ELECTRIC COMPANY, INC.
(A Wholly Owned Subsidiary of Hawaiian Electric Industries, Inc.)
AND SUBSIDIARIES

Consolidating Schedule - Financial Position

December 31, 1985

Assets	Hawaiian Electric Company, Inc.	Hawaii Electric Light Company, Inc.	Maui Electric Company, Limited	Adjustments and eliminations Dr. (Cr.)	Consolidated
Utility plant, at cost:					
Land	$ 18,228,199	2,708,018	883,756		21,819,973
Plant and equipment	761,594,991	149,631,863	123,283,636		1,034,510,490
Less accumulated depreciation	(229,818,677)	(54,395,269)	(36,303,445)		(320,517,391)
Plant acquisition adjustment	-	-	66,108		66,108
Construction in progress	9,358,040	4,765,324	1,190,851		15,314,215
Net utility plant	559,362,553	102,709,936	89,120,906		751,193,395
Investment in wholly owned subsidiaries, at equity	61,480,094	-	-	(61,480,094)(2)	-
Current assets:					
Cash	8,872,787	147,011	1,116,315		10,136,113
Temporary investments, at cost	62,357,621	1,200,778	10,280,090	(6,043,982)(1)	67,794,507
Customer accounts receivable, net	37,883,416	4,942,082	5,531,741		48,357,239
Accrued unbilled revenues, net	17,871,939	2,159,926	1,924,693		21,956,558
Other accounts receivable	4,460,094	204,149	145,399	(623,273)(1)	4,186,369
Fuel oil stock, at average cost	24,670,082	1,427,475	2,367,016		28,464,573
Materials and supplies, at average cost	5,024,165	1,123,097	3,190,310		9,337,572
Prepayments and other	1,092,313	88,718	40,469		1,221,500
Total current assets	162,232,417	11,293,236	24,596,033	(6,667,255)	191,454,431
Other assets:					
Unamortized debt expense	2,289,656	790,937	492,429		3,573,022
Long-term receivables and other	3,905,144	2,086,424	2,475,013		8,466,581
Total other assets	6,194,800	2,877,361	2,967,442		12,039,603
	$ 789,269,864	116,880,533	116,684,381	(68,147,349)	954,687,429

(Continued)

HAWAIIAN ELECTRIC COMPANY, INC.
(A Wholly Owned Subsidiary of Hawaiian Electric Industries, Inc.)
AND SUBSIDIARIES

Consolidating Schedule - Financial Position, Continued

Capitalization and Liabilities	Hawaiian Electric Company, Inc.	Hawaii Electric Light Company, Inc.	Maui Electric Company, Limited	Adjustments and eliminations Dr. (Cr.)	Consolidated
Capitalization:					
Common stock equity	$ 263,934,184	29,207,586	32,272,508	61,480,094 (2)	263,934,184
Cumulative preferred stock:					
Not subject to mandatory redemption	30,293,140	3,000,000	3,000,000		36,293,140
Subject to mandatory redemption	19,425,000	5,100,000	5,550,000		30,075,000
Long-term debt	226,008,805	35,815,856	37,980,000		299,804,661
Total capitalization	539,661,129	73,123,442	78,802,508	61,480,094	630,106,985
Current liabilities:					
Long-term debt due within one year	-	27,934	35,000		62,934
Preferred stock sinking fund requirements	1,075,000	200,000	150,000		1,425,000
Short-term borrowings	17,440,218	1,000,000	-	6,043,982 (1)	12,396,236
Accounts payable	29,116,021	2,182,153	2,362,265		33,660,439
Interest and preferred dividends payable	5,580,192	978,386	1,287,062	10,725 (1)	7,834,915
Income taxes	3,805,935	433,152	682,201		4,921,288
Other taxes accrued	10,899,347	2,928,141	3,167,991		16,995,479
Other	16,257,992	1,733,872	1,531,032	612,548 (1)	18,910,348
Total current liabilities	84,174,705	9,483,638	9,215,551	6,667,255	96,206,639
Deferred credits:					
Deferred income taxes	102,914,895	11,714,686	14,591,941		129,221,522
Unamortized investment tax credits	25,972,697	5,821,765	6,611,792		38,406,254
Other	3,650,639	4,643,179	1,232,356		9,526,174
Total deferred credits	132,538,231	22,179,630	22,436,089		177,153,950
Contributions in aid of construction	32,895,799	12,093,823	6,230,233		51,219,855
	$ 789,269,864	116,880,533	116,684,381	68,147,349	954,687,429

See accompanying auditors' report.

EXHIBIT C

HAWAIIAN ELECTRIC COMPANY, INC.
(A Wholly Owned Subsidiary of Hawaiian Electric Industries, Inc.)
AND SUBSIDIARIES

Consolidating Schedule - Income and Retained Earnings

Year ended December 31, 1985

	Hawaiian Electric Company, Inc.	Hawaii Electric Light Company, Inc.	Maui Electric Company, Limited	Adjustments and eliminations Dr. (Cr.)	Consolidated
Operating revenues	$ 497,028,122	66,247,916	72,338,055		635,614,093
Operating expenses:					
Fuel oil and purchased power	284,433,127	31,429,926	35,893,200		351,756,253
Other operation	51,927,989	8,513,508	8,980,989		69,422,486
Maintenance	15,440,305	2,734,824	3,124,887		21,300,016
Depreciation	22,677,913	5,289,448	4,200,623		32,167,984
Taxes, other than income taxes	45,312,468	6,119,341	6,651,657		58,083,466
Income taxes	29,611,394	4,523,796	4,979,363		39,114,553
	449,403,196	58,610,843	63,830,719		571,844,758
Operating income	47,624,926	7,637,073	8,507,336		63,769,335
Other income:					
Allowance for equity funds used during construction	1,176,438	186,941	55,363		1,418,742
Equity in earnings of subsidiaries	8,711,854	-	-	8,711,854 (2)	-
Other, net	4,453,355	310,082	965,283	588,532 (1)	5,140,188
	14,341,647	497,023	1,020,646	9,300,386	6,558,930
Income before interest and other charges	61,966,573	8,134,096	9,527,982	9,300,386	70,328,265
Interest and other charges:					
Interest on long-term debt	20,631,021	3,351,726	3,837,150		27,819,897
Amortization of net bond premium and expense	120,389	27,501	23,545		171,435
Other interest charges	991,599	34,254	20,018	(588,532)(1)	457,339
Allowance for borrowed funds used during construction	(358,000)	(61,090)	(19,351)		(438,441)
Preferred stock dividends of subsidiaries	-	-	-	1,736,471 (3)	1,736,471
	21,385,009	3,352,391	3,861,362	1,147,939	29,746,701
Net income	40,581,564	4,781,705	5,666,620	10,448,325	40,581,564
Preferred stock dividends of Company	4,310,590	853,403	883,068	(1,736,471)(3)	4,310,590
Net income for common stock	36,270,974	3,928,302	4,783,552	8,711,854	36,270,974
Retained earnings, beginning of year	131,261,124	13,939,740	14,904,526	28,844,266 (2)	131,261,124
	167,532,098	17,868,042	19,688,078	37,556,120	167,532,098
Dividends paid on common stock	28,570,657	3,154,055	3,470,510	6,624,565 (2)	28,570,657
Retained earnings, end of year	$ 138,961,441	14,713,987	16,217,568	30,931,555	138,961,441

See accompanying auditors' report.

EXHIBIT C

HAWAIIAN ELECTRIC COMPANY, INC.
(A Wholly Owned Subsidiary of Hawaiian Electric Industries, Inc.)
AND SUBSIDIARIES

Consolidating Schedule - Sources of Funds for Construction

Year ended December 31, 1985

	Hawaiian Electric Company, Inc.	Hawaii Electric Light Company, Inc.	Maui Electric Company, Limited	Adjustments and eliminations Dr. (Cr.)	Consolidated
Operations:					
Net income	$ 40,581,564	4,781,705	5,666,620	10,448,325	40,581,564
Equity in net income for common stock of subsidiaries	(8,711,854)	-	-	(8,711,854)	-
	31,869,710	4,781,705	5,666,620	1,736,471	40,581,564
Principal nonfund charges (credits) to income:					
Depreciation and amortization	23,179,033	5,341,651	4,342,459		32,863,143
Deferred income taxes	7,085,666	1,156,761	1,614,742		9,857,169
Investment tax credits, net	1,159,126	288,780	81,421		1,529,327
Allowance for borrowed and equity funds used during construction	(1,534,438)	(248,031)	(74,714)		(1,857,183)
	61,759,097	11,320,866	11,630,528	1,736,471	82,974,020
Less:					
Preferred stock dividends	4,310,590	853,403	883,068	(1,736,471)	4,310,590
Common stock dividends	28,570,657	3,154,055	3,470,510	(6,624,565)	28,570,657
	32,881,247	4,007,458	4,353,578	(8,361,036)	32,881,247
	28,877,850	7,313,408	7,276,950	(6,624,565)	50,092,773
Other sources (uses):					
Common stock dividends received from subsidiaries	6,624,565	-	-	6,624,565	-
Contributions in aid of construction	2,252,739	1,390,099	802,790		4,445,628
Customer advances for construction, net	296,941	(71,666)	83,431		308,706
Customer accounts receivable, net	2,652,188	375,466	837,655		3,865,309
Accrued unbilled revenues, net	1,893,608	435,812	134,866		2,464,286
Fuel oil stock	3,422,398	(23,753)	358,669		3,757,314
Accounts payable	14,895,177	425,164	424,764		15,745,105
Taxes accrued	(6,098,230)	415,998	37,821		(5,644,411)
Net change in other working capital items	(519,796)	(239,431)	(364,980)	2,213	(1,126,420)
Miscellaneous, net	(2,653,557)	(951,950)	(335,914)		(3,941,421)
	22,766,033	1,755,739	1,979,102	6,626,778	19,874,096
Carried forward	$ 51,643,883	9,069,147	9,256,052	2,213	69,966,869

(Continued)

HAWAIIAN ELECTRIC COMPANY, INC.
(A Wholly Owned Subsidiary of Hawaiian Electric Industries, Inc.)
AND SUBSIDIARIES

Consolidating Schedule - Sources of Funds
for Construction, Continued

	Hawaiian Electric Company, Inc.	Hawaii Electric Light Company, Inc.	Maui Electric Company, Limited	Adjustments and eliminations Dr. (Cr.)	Consolidated
Brought forward	$ 51,643,883	9,069,147	9,256,052	2,213	69,966,869
Financing:					
Other long-term debt	4,593,300	1,668,282	71,420		6,333,002
Short-term borrowings	7,536,095	1,000,000	-	(1,858,231)	10,394,326
Retirement of long-term debt	-	(1,055,642)	(35,000)		(1,090,642)
Retirement of preferred stock	(1,060,740)	(200,000)	(50,000)		(1,310,740)
Temporary investments	(27,670,315)	993,611	(3,580,090)	1,856,018	(32,112,812)
Capital stock expense	(94,185)	(26,018)	-		(120,203)
	(16,695,845)	2,380,233	(3,593,670)	(2,213)	(17,907,069)
Total funds from above sources	34,948,038	11,449,380	5,662,382		52,059,800
Allowance for borrowed and equity funds used during construction	1,534,438	248,031	74,714		1,857,183
Construction expenditures	$ 36,482,476	11,697,411	5,737,096	-	53,916,983

See accompanying auditors' report.

ATTACHMENT E

BASIS FOR NOT MONITORING GROUNDWATER

Hawaiian Electric Company based the decision not to monitor the groundwater at the Honolulu Power Plant closure site on several factors: one, there has been no indication that leakage has occurred; two, the waste streams treated in the sumps are only occasionally, and then only marginally, hazardous; three, the waste streams had a short residence time in the sumps before treatment rendered them nonhazardous; and, four, any leakage would have been flushed away by the tidal actions in the saline groundwater underlying the site and would be undetectable.

Routine visual inspections by plant personnel indicate that the sumps have maintained their structural integrity and are not leaking. The sumps are an integral part of the power plant foundation. They are constructed of reinforced concrete, with a wall thickness of one foot. The bottom of the sumps is located below sea level in an area which has a water table that is influenced by tidal variations, and there is no concurrent change in the liquid levels in the sumps as the groundwater level oscillates.

Any liquid which could have been released into the environment would not materially affect groundwater quality. The liquid wastes handled in the sumps were considered hazardous

wastes because of pH and metals content. Table 3-1 in Section 3 of the Closure Plan shows that the wastes seldom exceeded the Federal EP Toxicity limits for metals. After neutralization and precipitation of the waste, the liquid portion and sludge were nonhazardous. The precipitated sludge was removed after treatment and was not stored in the sumps for long periods. The Honolulu Harbor has been polluted by several of the industries in the area. The aquifer below the power plant is not a usable aquifer. Therefore, it is unlikely that the level of hazardous constituents in the wastes in the sumps would have any influence on groundwater quality in the area.

The sumps are sunk into porous coral material which is below sea level and is constantly being flushed by tidal fluctuations. Any leakage which might have occurred would be dissipated by this flushing action. This location on the edge of a deep water harbor makes development of an adequate groundwater monitoring system nearly impossible.

If, during closure, it is found that there is evidence that the sumps have not maintained their structural integrity and may have in fact leaked, EPA will be notified.

HID 000 150 680

HID000150680

DLT
QA

CLOSURE PLAN AND COST ESTIMATE FOR THREE EXISTING SUMPS LOCATED AT HONOLULU GENERATING STATION

Prepared for:

HAWAIIAN ELECTRIC COMPANY, INC.
HONOLULU, HAWAII

Prepared by:

MITTELHAUSER CORPORATION
EL TORO, CALIFORNIA

NOVEMBER, 1985

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LIST OF ATTACHMENTS

LIST OF TABLES

LIST OF FIGURES

SECTION 1.0

INTRODUCTION

CLOSURE PLAN AND CLOSURE COST ESTIMATE

1.0 INTRODUCTION

This closure document has been prepared for the Hawaiian Electric Company's Honolulu Generating Station which is located in Honolulu, Hawaii. The plan is being submitted to EPA Region IX for approval before initiating closure of three concrete sumps which have handled potentially hazardous waste. The owner, facility name, address, type of industry, type of hazardous waste management unit being closed, local contact, and EPA Identification Number are presented below:

- Owner: Hawaiian Electric Company, Inc. (HECO)
- Name: Honolulu Generating Station
- Type of Industry: Power Generation SIC Code 4911
- Facility Address: 170 Ala Moana Blvd. Honolulu, Hawaii 96813
- Facility Telephone: 1-808-548-3538
- Facility Contact: Leonard DeCorte Station Superintendent
- Corporate Address: P.O. Box 2750 Honolulu, Hawaii 96840

- Corporate Contact: Dr. Brenner Munger, Manager, Environmental Department
- Corporate Telephone: 1-808-548-6880
- EPA ID Number: HID000150680
- Unit Closing: Three Existing Concrete Sumps
  - sump #2
  - sump #2A
  - sump #3

This plan was prepared using the following as a basis: Resource Conservation and Recovery Act (RCRA) of 1976 (PL 94-580), as amended; and EPA SW-846: "Test Methods for Evaluating Solid Wastes." Copies of this plan and revisions, if any, will be kept at the following locations until closure is completed:

- Operations Superintendent's Office - on-site
- Manager of Environmental Department's Office - Corporate Office

Closure is considered complete when the closure steps in Chapter 4 have been certified complete by Hawaiian Electric Company and by an independent registered engineer and when a letter has been received from EPA agreeing that closure is complete.

This closure plan is for the closure of three sumps. These sumps are being closed as interim status RCRA facilities. They have, in the past, stored potentially hazardous wastewater

which may have had the characteristics of corrosivity or of EP Toxicity for metals content. Therefore, HECO is closing the unit in accordance with RCRA interim status regulations guidelines to ensure that the unit does not present a threat to human health or the environment.

Closure of the three sumps will be coordinated with construction and start-up of new treatment facilities which are exempt from RCRA permit requirements. After start-up of the new system, all hazardous or potentially hazardous wastes will be treated in above grade tanks. The tanks treating hazardous wastes will be part of a wastewater treatment unit, as defined in 40CFR260.10. Wastewater treatment units are exempt from RCRA Part B Permit requirements under the standards set forth in 40CFR270.1(c)(2)(v). Fireside and Air Heater Washwater, which is exempt from RCRA regulation per 40CFR261.4(b)(4), will also be treated solely in tanks. Although this waste is exempt from RCRA regulation, HECO recognizes that it can potentially be corrosive or have the characteristic of EP Toxicity. Therefore, the Honolulu wastewater treatment system is being modified to handle this waste in a way which will eliminate any potential threat to human health or the environment.

More detailed descriptions of the existing and proposed treatment systems are presented in Attachment A.

It is the intention of HECO to remove from the unit being closed any hazardous waste and hazardous waste contaminated residue. When closure is completed, there will be no hazardous wastes left at the facilities. Therefore, a post-closure plan is not required. After closure, the three sumps will remain in service for non-hazardous wastewater handling.

SECTION 2.0

FACILITY INFORMATION

2.0 FACILITY INFORMATION

2.1 GENERAL PLANT DESCRIPTION

Hawaiian Electric Company (HECO) operates a 118 megawatt steam electric generating station (power plant) named Honolulu Generating Station. The plant occupies a 3.4 acre site on the south side of the island of Oahu on the eastern side of Honolulu Harbor. The station's boundaries are Nimitz Highway to the north, Ala Moana Boulevard to the south, and Richards and Bishop Streets to the east and west, respectively.

A map of the area from a USGS map is presented in Figure 2-1. A plot plan of the power station is shown in Figure 2-2. Table 2-1 gives the specifications for the two generating units.

2.2 FUEL SUPPLY

Low sulfur fuel oil for Honolulu Station's two boilers is delivered to the plant site via a pipeline from the supplier. Fuel oil is stored on-site in two 15,000 barrel tanks and off-site in two 80,000 barrel tanks at the nearby Iwilei storage facility. At peak load, the Honolulu plant requires 206 barrels of fuel oil per hour.

2.3 OPERATING PERIOD

Each of Honolulu Station's two generating units normally operates 15 to 18 hours per day, 7 days per week.

2.4 WATER SUPPLY

The city water system provides potable and boiler make-up water. The condenser cooling water source is sea water from Honolulu Harbor. The discharge point is in Honolulu Harbor and is regulated by NPDES discharge permit number HI0000027.

2.5 PERSONNEL AND PAYROLL

Honolulu generating station has an operating staff of 82 persons (1984) while the total operating staff for all three HECO stations is 362 persons. The gross biweekly payroll for all three stations is $536,397.80.

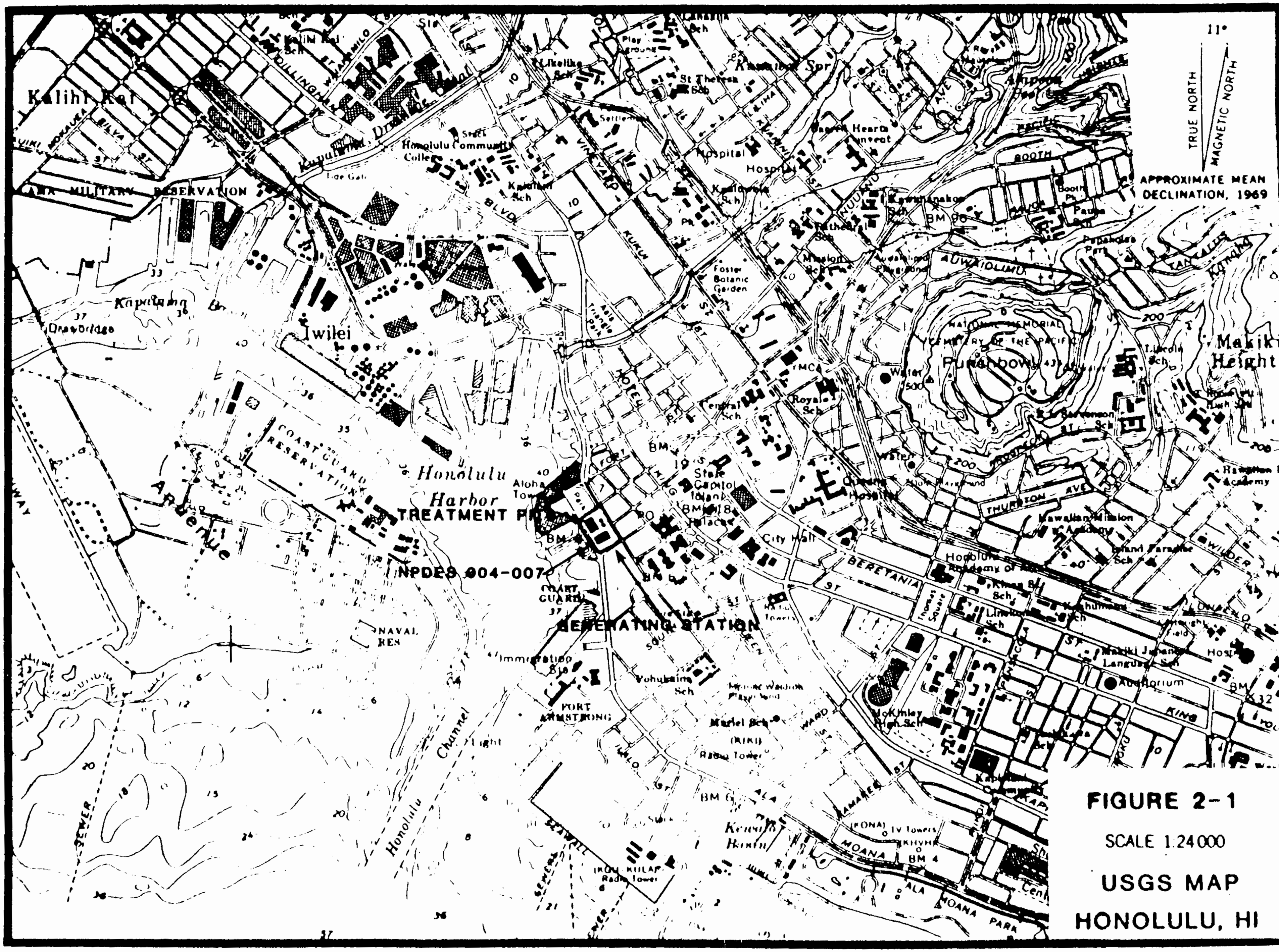


FIGURE 2-1

SCALE 1:24000

USGS MAP

HONOLULU, HI

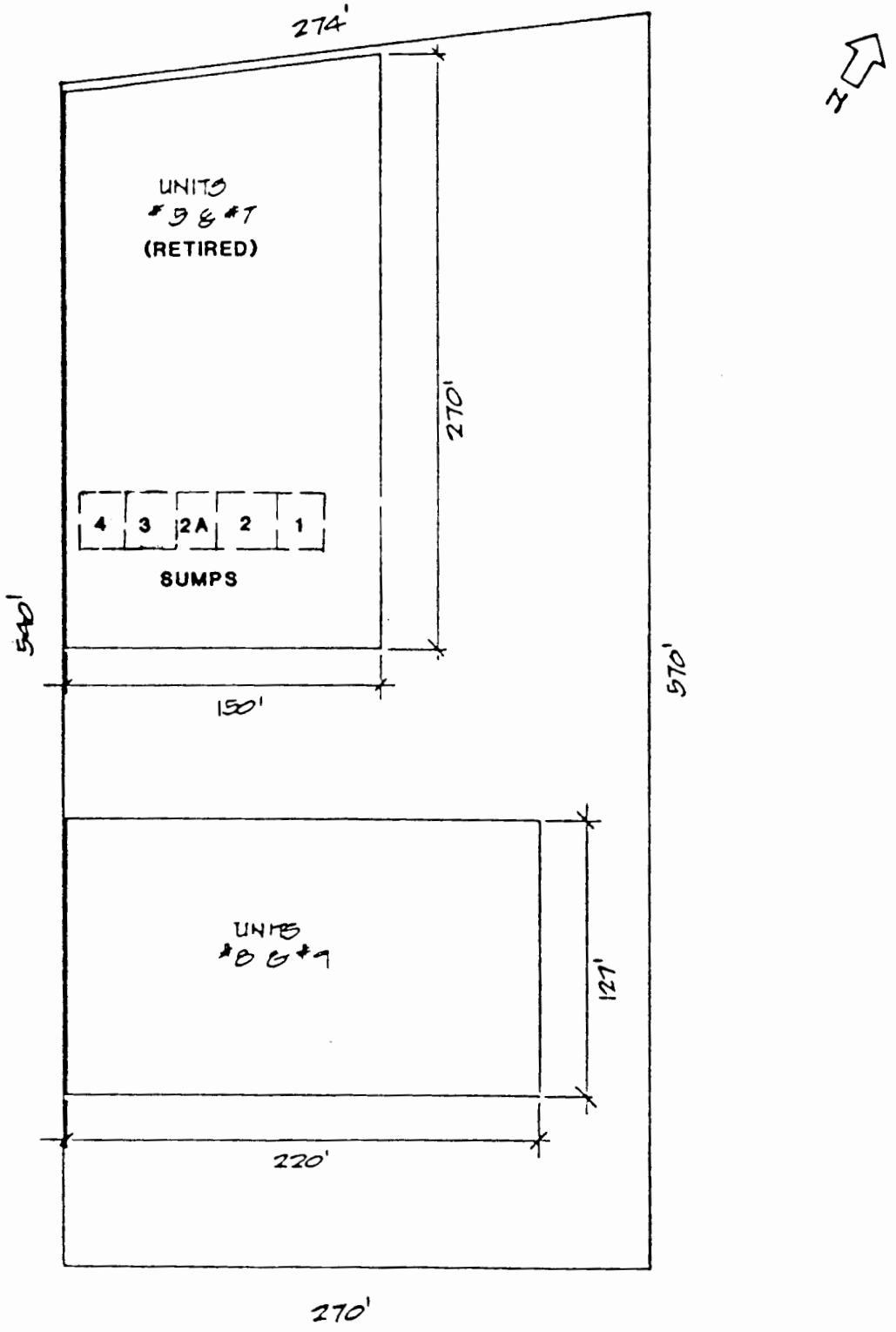


FIGURE 2-2

SCALE 1"=80'

HONOLULU GENERATING SYSTEM

TABLE 2-1

GENERATING SPECIFICATIONS
HAWAIIAN ELECTRIC COMPANY, INC.
HONOLULU GENERATING STATION

	UNIT 8	UNIT 9
HEIGHT OF BOILER BLDG.*,FT.	103'-0"	103'-0"
HEIGHT OF STACKS*, FT.	161'-6"	161'-6"
*ABOVE PLANT GROUND FLOOR		
BOILERS		
MANUFACTURER	BABCOCK & WILCOX	BABCOCK & WILCOX
STEAM TEMPERATURE, F	950	950
STEAM PRESSURE, PSIG	1315	1315
STEAM FLOW, LBM/HR	485,000	485,000
TYPE OF BURNER	MECHANICAL ATOM.	MECHANICAL ATOM.
TURBINES		
MANUFACTURER	WESTINGHOUSE	WESTINGHOUSE
NUMBER OF STAGES	32	32
THROTTLE TEMPERATURE, F	950	950
THROTTLE PRESSURE, PSIG	1250	1250
GENERATORS		
MANUFACTURER	WESTINGHOUSE	WESTINGHOUSE
GENERATING CAPACITY, KW	58,000	60,000
VOLTAGE, KV	11.5	11.5
SPEED, RPM	3600	3600
COOLING	HYDROGEN	HYDROGEN
CONDENSER		
MANUFACTURER	WESTINGHOUSE	WESTINGHOUSE
CAPACITY, GPM	59,920	59,920
COOLING SURFACE, SQ. FT.	40,000	40,000
TEMPERATURE RISE, F (OUT - IN)	10	10
COOLING WATER	SEAWATER	SEAWATER

SECTION 3.0

HAZARDOUS WASTE MANAGEMENT FACILITIES

3.0 HAZARDOUS WASTE MANAGEMENT FACILITIES

Hawaiian Electric Company has prepared this Closure Plan for the following waste management unit located at the Honolulu Generating Station. The locations of the unit is shown on Figure 2-2. Attachment C presents diagrams of the waste management unit. The unit consists of three sumps:

1. Sump #2

   - Material of Construction: Concrete
   - Dimensions: 25x32x10 feet
   - Area: 800 sq.ft.
   - Total Depth: 10 feet
   - Weir Height: 5 feet
   - Maximum Operating Capacity: 30,000 gallons
   - Waste handled in the sump:

     The sump has received waste generated by operation and maintenance activities at the power plant. These wastes are potentially corrosive and EP Toxic.

2. Sump #2A

   - Material of Construction: Concrete
   - Dimensions (average): 25x7x5 feet
   - Area: 169 sq.ft.
   - Depth: 5 feet
   - Maximum Operating Capacity: 6,300 gallons

- Waste handled in the sump:

  The sump has received waste generated by operation and maintenance activities at the power plant. These wastes are potentially corrosive and EP Toxic.

- Use and design of Sump #2A:

  Sump #2A was originally designed and functioned as an oil-water separator for sump #3. There is a weir between sumps #2A and #3. The wall between Sumps #2A and #3 is five feet high and has a hole in it, so the sumps operate essentially as one sump. The four walls of the combined #2, #2A and #3 sumps are each 10 feet high. The sumps operate with five feet of freeboard. As noted above, the average Sump #2A surface dimensions are 25 feet x 7 feet. The surface area of 169 sq. feet takes into account the space occupied by the weir and irregularities in the sump shape. See Attachment C for engineering details and piping diagrams.

3. Sump #3

- Material of Construction: Concrete
- Dimensions: 25x37x10 feet
- Area: 925 sq.ft.
- Total Depth: 10 feet
- Weir Height: 5 feet
- Maximum Operating Capacity: 35,000 gallons
- Waste handled in the sump:

  The sump has received waste generated by operation and maintenance activities at the power plant. These wastes are potentially corrosive and EP Toxic.

3.1 MAXIMUM EXTENT OF OPERATIONS

The maximum extent of operations for this hazardous waste management unit is the total surface area of the unit. The maximum extent of operations for the sumps located at the Honolulu Generating Station is as follows:

o Sump #2	25x32 feet	800 sq.ft.
o Sump #2A	25x7 feet	169 sq.ft.
o Sump #3	25x37 feet	925 sq.ft.
o Total		1,894 sq.ft.

3.2 MAXIMUM INVENTORY

The maximum inventory of the unit is the total volume of waste contained in the sumps at maximum operating capacity. The maximum inventory of the sumps is as follows:

o Sump #2	30,000 gallons
o Sump #2A	6,300 gallons
o Sump #3	35,000 gallons
o Total	71,300 gallons

3.3 WASTE STREAMS GENERATED

There are six wastewater streams generated at the Honolulu Station. The waste streams and the approximate volumes generated are listed below:

Type of Waste stream	Maximum Volume Generated
Condenser foam cleaning waste	10,000 gal/wash
Vertan 675 (boiler tube cleaning waste)	35,000 gal/cleaning (includes rinse)
Demineralizer regeneration wastes	10,000 gpd
Boiler fireside wash	100,000 gpd (for 3 days)
Air heater wash	40,000 gal/wash
Low volume wastes (non-hazardous)	60,000 gpd

3.3.1 Boiler and Condenser Tubeside Cleaning Wastewater

Waste from cleaning boiler tube inner walls and from condensers are produced infrequently, on an average of once every four years. There are two types of metal cleaning waste: (1) acid foam cleaning waste and (2) Vertan cleaning waste. These two waste streams may be corrosive or may have the characteristic of EP Toxicity for chromium and lead. This waste is collected from direct connections from the process unit. The waste is then treated in a wastewater treatment unit and discharged in compliance with NPDES permit number HI0000027.

3.3.2 Demineralizer Regeneration Waste

Demineralizer regeneration waste is produced during daily regeneration of the demineralizer ion exchange resins. The

process produces alternate acid and caustic waste streams which may have the characteristic of corrosivity. The waste is pumped to tanks where it is recirculated and, because of the alternating acid and caustic streams, is self-neutralized. The treatment tanks are part of a wastewater treatment unit.

3.3.3 Air Heater and Fireside Wash Wastewater

This waste is exempt from Federal regulation according to 40CFR261.4(b)(4). Periodic water washing of air preheaters and boiler firesides removes fly ash, slag, and corrosion products. This waste has, in the past, been treated in the sumps which are being closed. This waste has the potential to have hazardous characteristics due to pH and metal corrosion products removed in the washing process. Therefore, HECO is upgrading its wastewater treatment system to handle this waste only in tanks.

3.3.4 Low Volume Waste

Low volume waste is primarily boiler blowdown and water from building drains. This is a non-hazardous waste. It is collected in a sump, the pH is adjusted, if necessary, and the waste is discharged in compliance with NPDES permit number HI0000027.

3.4 WASTE CHARACTERISTICS

All available waste stream analyses are summarized on Table 3-1. All analyses were performed by EPA approved methods. The treated wastewater and sludges are not hazardous. During generation of some of the cleaning wastes, extractable metal concentractions are occasionally above the EP Toxicity limits.

Condenser and boiler cleaning wastes and demineralizer regeneration wastes are typically corrosive before neutralization.

The sumps contain an estimated average of 6-inches of sludge (or 10%). The sludge normally has a very high water content.

TABLE 3-1

HONOLULU POWER PLANT
WASTE STREAM ANALYSIS

WASTE STREAM	EP TOXICITY mg/l As	Ba	Cd	Cr	Pb	Hg	Se	Ag	pH
Condenser Cleaning									
Unit 8, 9-25-82									
#81: 15 min.	0.20	<0.5	0.08	0.6	6.2	<0.01	<0.01	0.6	2.1
30 min.	0.27	<0.5	0.14	2.1	10.4	<0.01	<0.01	1.5	1.5
45 min.	0.22	<0.5	0.07	1.4	6.7	<0.01	<0.01	0.7	1.5
60 min.	0.40	<0.5	0.04	1.2	5.3	<0.01	<0.01	0.7	1.5
#82: 15 min.	0.37	<0.5	0.09	1.8	17.2	<0.01	<0.01	0.6	2.1
30 min.	0.57	<0.5	0.12	1.5	16.8	<0.01	<0.01	1.0	1.5
45 min.	0.25	<0.5	0.04	0.8	4.7	<0.01	<0.01	0.7	1.5
60 min.	0.28	<0.5	0.02	0.7	4.5	<0.01	<0.01	0.7	1.3
Unit 9, 9-26-82									
#91: 15 min.	0.07	<0.5	0.04	0.5	2.5	<0.01	<0.01	0.3	1.4
30 min.	0.41	<0.5	0.06	1.6	7.1	<0.01	<0.01	0.9	1.4
45 min.	0.38	<0.5	0.03	1.0	3.5	<0.01	<0.01	0.8	1.4
#92: 15 min.	0.12	<0.5	0.02	0.8	2.9	<0.01	<0.01	0.3	1.6
30 min.	0.58	<0.5	0.11	2.3	11.8	<0.01	<0.01	1.3	1.4
45 min.	0.42	<0.5	0.04	1.0	3.8	<0.01	<0.01	0.9	1.4
Sump #3									
Before Treatment:	<0.01	<0.5	0.02	0.6	0.8	<0.01	<0.01	0.4	2.7
After Treatment:	<0.01	<0.5	0.02	0.1	0.3	<0.01	<0.01	0.1	8.0
After Settling:	<0.01	<0.5	0.02	0.1	0.3	<0.01	<0.01	0.1	8.0
During Truck Loading:	<0.01	<0.5	0.02	0.2	0.4	<0.01	<0.01	0.1	8.0
Vertan 675									
2-5-73				14	5.5				9.3
9-5-84	0.05	1.0	1.0	3.5	2.6	0.005	0.017	0.07	10.0
8-28-84	0.005	<0.5	0.04	0.12	<0.1	0.001	0.001	<0.05	9.4

WASTE STREAM	EP TOXICITY mg/l As	Ba	Cd	Cr	Pb	Hg	Se	Ag	pH
Demineralizer Waste									
Unit 1, 9-14-81									
Acid Drain	<0.01	<0.5	0.05	<0.1	0.2	<0.01	<0.01	<0.1	1.1
Caustic Drain	<0.01	<0.5	0.14	0.1	0.3	<0.01	<0.01	<0.1	12.8
Unit 2, 9-17-81									
Acid Drain	<0.01	<0.5	0.06	0.1	0.2	<0.01	<0.01	<0.1	1.1
Caustic Drain	0.01	<0.5	0.14	0.1	0.2	<0.01	<0.01	<0.1	12.7
Sludge									
Sump #4, 1-31-85	0.02	0.23	<0.005	<0.01	<0.05	0.002	0.003	<0.02	6.8
Transfer Yd. Sump 1-31-85	<0.001	0.18	<0.005	<0.01	<0.05	0.002	<0.001	<0.02	6.8
Sump #2, 2-19-82	0.1	<0.5	0.01	<0.1	<0.1	<0.01	<0.01	<0.1	9.5

SECTION 4.0

CLOSURE

4.0 CLOSURE

Hawaiian Electric Company has made the decision to upgrade the current wastewater management system at the Honolulu Generating Station. After construction and start-up of new wastewater treatment facilities and closure of sumps #2, 2A, and 3, all hazardous or potentially hazardous wastes generated by the power plant will be treated in tanks to render them non-hazardous. The tanks will be part of a wastewater treatment unit which is exempt from RCRA permit requirements. The expected start-up date for the new facilities is in January of 1986. After closure, the sumps will be returned to service for handling non-hazardous wastes.

Submission of this Closure Plan for approval also constitutes notification to EPA of intent to close all Honolulu Generating Station units which have handled potentially hazardous wastes. Therefore, per 40CFR265.112(c), closure is scheduled to begin 180 days after notification of intent to close and after approval of the Closure Plan by EPA. Therefore, closure is scheduled to begin in May of 1986. Until closure begins, HECO will continue to take all steps to prevent threats to human health and the environment and will maintain current security operations.

If EPA could approve this Closure Plan and waive the 180 day notification period, closure could begin anytime after start-up of the new treatment facilities in January of 1986. HECO will notify EPA immediately if construction delays or start-up problems occur which could affect the closure date.

When the sumps have been certified closed by Hawaiian Electric Company, Inc., and by an independent registered professional engineer, and a letter is received from EPA Region IX, acknowledging that closure is complete, there will be no hazardous waste left at the sumps, and they will be returned to service for non-hazardous waste use.

Hawaiian Electric Company is basing this Closure Plan on analyses which indicate that the treated liquid and sludge contained in the sumps are not hazardous. If the results of the Sampling and Analysis Program indicate that the sumps contain hazardous waste, and the hazardous wastes and hazardous waste residues cannot be either treated or removed, this Closure Plan and closure cost estimate will be revised and resubmitted to EPA Region IX for approval.

A schedule of the following closure steps is presented in Figure 4-1.

Step 1: Notification/Submission of Closure Plan

EPA Region IX will be notified 180 days or more prior to start of closure for approval of the Closure Plan.

Step 2: Decontamination of Lines

The piping system into the three sumps which have held hazardous wastes will be flushed with plant utility water for 2 to 3 minutes. A sample of the flush water will be taken during the last 30 seconds of rinsing. The sample will be analyzed per Attachment B for pH and EP toxicity for the metals listed on Table B-1 in Attachment B. If the results indicate that the flush water is hazardous, this flushing step will be repeated until the wash water is non-hazardous. If the lines cannot be adequately flushed, they will be removed and disposed of at an EPA approved facility. If a significant amount of scale is present in the pipes, a sample of the scale will be obtained. It will be analyzed for the same constituents as the sludge. (See Step 4). If the scale is hazardous, the contaminated piping will be removed. All analysis results will be submitted to EPA.

Step 3: Sample and Analyze Liquids in the Sumps

The liquid in the sumps will be sampled and analyzed for pH and EP toxicity, per the Sampling and Analysis Plan in Attachment B, to determine if it is a hazardous waste. All analysis results will be submitted to EPA.

Step 4: Sample and Analyze Sludge in the Sumps

The sludge in the sumps will be sampled and analyzed to determine if it is a hazardous waste, per the Sampling and Analysis Plan in Attachment B. All analysis results will be submitted to EPA.

Step 5: Review the Results of Steps 3 and 4

If the liquid and sludge in the sumps are non-hazardous the sumps are closed for hazardous waste handling, they will continue in non-hazardous services. Go to Step 10 to complete closure activities.

If the liquid or sludge is hazardous, as defined in Table B-1 in Attachment B, Sampling and Analysis Plan, and by statistical analysis based on EPA SW-846, closure will continue with the following steps.

Step 6: Waste Removal

The liquid in the sumps (hazardous or non-hazardous) can be handled in one of two ways. The liquid waste can be treated at the on-site wastewater treatment unit and be discharged in compliance with the facility's NPDES discharge permit. If, because of volume or level of contaminants, it cannot be adequately treated on-site, it will be treated or disposed of at an approved off-site facility. Non-hazardous waste can be shipped to HECO's Kahe Generating Station for treatment. Hazardous liquids will be collected by a licensed hazardous-waste transporter for disposal at a licensed hazardous waste disposal facility. Transportation and disposal of any hazardous waste will be tracked by a Uniform Hazardous Waste Manifest.

If the sludge in the sumps is non-hazardous, it will be removed by vacuum truck and disposed of in an environmentally acceptable manner. If the sludge is hazardous, it will be collected by a licensed hazardous waste transporter for disposal at an approved hazardous waste disposal facility. Transportation and disposal will be tracked by a Uniform Hazardous Waste Manifest.

Step 7: Decontamination of Concrete

If the sludge or liquid is hazardous, the sumps will be cleaned after removal of all waste in the sumps. The interior of each sump will be thoroughly cleaned by either hydroblasting or steam cleaning. All workers will wear protective clothing.

All washing residue will be contained in the sumps. It will then be removed and handled as a hazardous waste. It may be treated on-site at the wastewater treatment unit and discharged in compliance with the NPDES permit. Alternately, it can be collected by a licensed transporter for disposal at an approved hazardous waste facility. Transportation and disposal will be tracked by a Uniform Hazardous Waste Manifest.

Step 8: Sample, Analyze, and Inspect Concrete

The concrete in the sides and bottom of each sump will be sampled and analyzed to determine if it is contaminated with hazardous constituents. The sampling and analysis will be accomplished as described in Attachment B, Sampling and Analysis Plan. The concrete will be analyzed for pH and the EP toxicity constituents on Table B-1 in Attachment B. All analysis results will be submitted to EPA.

After cleaning, the concrete in each sump will be thoroughly inspected, once, by an independent professional engineer for pitting or cracking which might have allowed leakage.

Step 9: Review of Concrete Analysis and Inspection

If the results of the concrete analyses determine that the concrete is not hazardous, the sumps are considered closed for hazardous waste handling. The sump will continue in non-hazardous service. Step 10 will complete closure activities.

If the results of the concrete analyses indicate that the concrete is contaminated with hazardous waste constituents based on the levels on Table B-1 and by statistical analysis per EPA SW-846, closure activities will cease. The Closure Plan will be revised to allow HECO to investigate the extent of contamination and to determine the most appropriate closure procedures. Disposal closure will be considered as an option if the sump cannot be decontaminated. The sumps are an integral part of the building structure and cannot be removed. Based on recent test results of the sump

contents, it is unlikely that the concrete will be contaminatd. However, if it should occur, a revised closure plan will be submitted to EPA for approval.

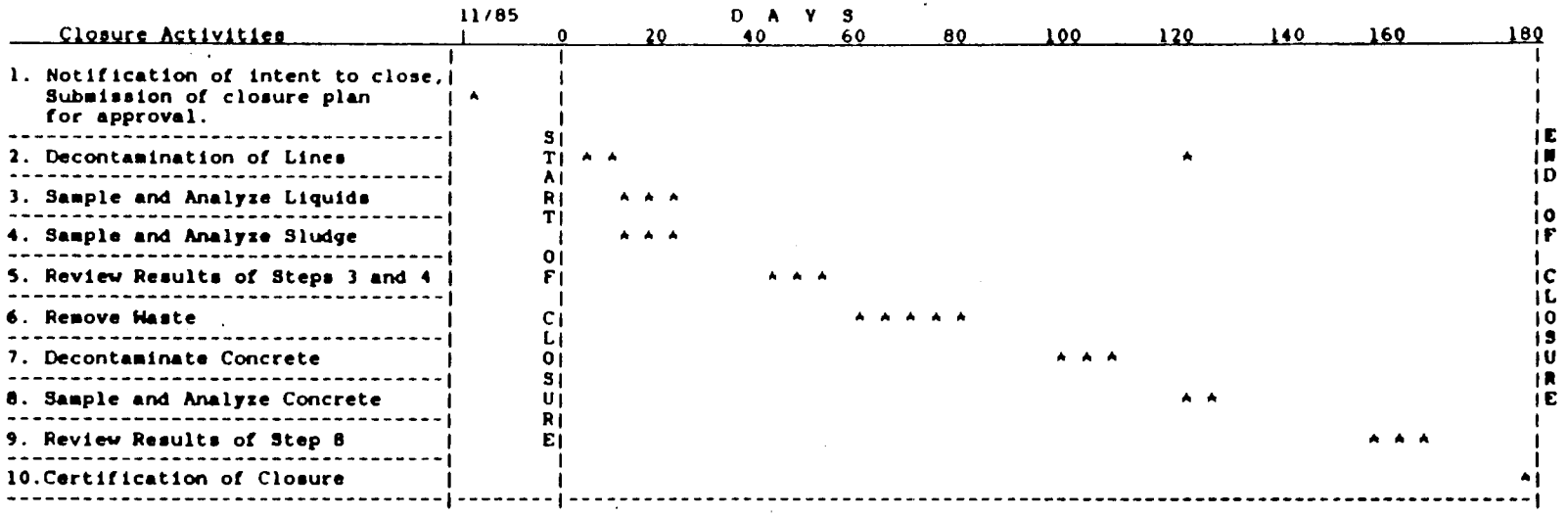
If inspection of the concrete reveals structural damage which could have allowed leakage, a revised Closure Plan will be submitted. The revised closure plan will include procedures to determine the extent of any contamination which might have occurred.

Step 10: Certification of Closure

When closure is completed, HECO will submit a certification of closure activities to EPA Region IX. An independent professional engineer registered in Hawaii and an engineer from Hawaiian Electric Company will inspect the sumps after completion of all closure steps. They will certify that the sumps have been closed in accordance with all applicable steps in the approved Closure Plan.

FIGURE 4.1

HONOLULU CLOSURE SCHEDULE



SECTION 5.0

DECONTAMINATION

5.0 DECONTAMINATION

5.1 DECONTAMINATION OF EQUIPMENT

The following decontamination procedures will be followed if any hazardous wastes are found.

All equipment, such as piping, trucks, samplers, trowels, and shovels used during closure will be cleaned before leaving the site or before re-use. A steam cleaner or water spray will be used to remove liquid and solid residue, since the water, sludge, or concrete is not expected to adhere strongly to the equipment. Cleaning of the equipment used at the site will take place either into a 55-gallon drum, back into the sumps, or on a waterproof tarp. The tarp will be placed on a graded area so that all liquid and residue can be contained and collected.

5.2 DECONTAMINATION RESIDUES

Decontamination residues, including washwater, will be treated in tanks at the on-site wastewater treatment unit and discharged in accordance with the facility's NPDES Discharge Permit number HI0000027. If, because of volume or concentration, the waste would exceed NPDES limits, the waste will be shipped off-site to HECO's Kahe or Waiau facility. If any sludge or

liquid is determined to be hazardous during closure, the tarp will be considered hazardous and will be transported to an off-site hazardous waste disposal facility by a registered transporter under a Uniform Hazardous Waste Manifest for disposal. If the sludges and wastewater are non-hazardous, the tarp will be washed with water. The washwater will be handled as a decontamination residue. The tarp will be disposed of in an environmentally sound manner.

SECTION 6.0

SAMPLE CONTROL

6.0 SAMPLE CONTROL

The closure procedures will require samples of liquid, sludge and concrete to be taken and analyzed. All samples will be labeled and sealed to prevent contamination of, or tampering with, the samples.

To establish the documentation necessary to trace sample possession from the time of custody, a chain of custody record will be filled out and will accompany every set of samples. An example of a chain of custody record is illustrated in Figure 6-1.

The laboratory will conduct established quality control procedures throughout the analyses. This will include blanks, spikes, internal standards, and duplicate samples. This information will be available for each sample set.

Further details are presented in the Sampling and Analysis Program in Attachment B.

MITTELHAUSER corporation

22691 LAMBERT STREET • SUITE 606 • EL TORO, CA 92630

FIGURE 6-1

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME					NO. OF CON-TAINERS								REMARKS
SAMPLERS: *(Signature)*														
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION									

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

MITTELHAUSER corporation

SAMPLING ANALYSIS REQUEST

PART I: Field Section

Collector _____ Date Sampled _____ Time _____ hours

Affiliation of Sampler _____

Address _____
number street city state zip

Telephone (___)_____ Company Contact _____

LABORATORY SAMPLE NUMBER	COLLECTOR'S SAMPLE NO.	TYPE OF SAMPLE*	FIELD INFORMATION**

Analysis Requested _____

Special Handling and/or Storage _____

PART II: LABORATORY SECTION**

Received by _____ Title _____ Date _____

Analysis Required _____

* Indicate whether sample is soil, sludge, etc.
**Use back of page for additional information relative to sample location.

FIGURE 6.2

SECTION 7.0

CLOSURE COST ESTIMATE

7.0 CLOSURE COST ESTIMATE

Closure costs for the three sumps are summarized on Table 7-1. Recent analysis of the sump liquids and sludges conducted by approved test methods have demonstrated that the wastes do not exhibit the EP Toxicity or corrosivity characteristics. Therefore, this closure cost estimate summarizes the costs for sampling and analyzing liquids and sludges and treating the wastes in tanks at the on-site wastewater treatment unit and discharging the waste under NPDES permit number HI0000027.

Attachment D is a copy of HECO's financial assurance for the Kahe and Waiau facilities. This assurance is presently being revised to include the Honolulu facility.

TABLE 7-1

SUMMARY OF CLOSURE COSTS FOR HONOLULU GENERATING STATION

Step	Description	Cost
1	Notify EPA of Closure	N/C
2	Decontaminate lines	1,000
3	Sample and analyze liquid Sampling: 16 hrs @ $50/hr Analysis: 6 samples @ $400 ea	3,200
4	Sample and analyze sludge Sampling: 32 hrs @ $50/hr Analysis: 6 samples @ $450 ea	4,300
5	Review results of steps 3,4	3,000
6	Waste removal 37 cubic yards @ $100/cu yd	3,700
7	Decontaminate concrete surface	1,500
8	Sample and analyze concrete Sampling: 16 hrs @ $100/hr Analysis: 12 samples @ $450 ea	7,000
9	Review of step 8	2,000
10	Certification of closure PE: 20 hrs @100/hr. Expenses: $1000.	3,000
-	Project management	3,000
	TOTAL ESTIMATE	31,700

SECTION 8.0

POST-CLOSURE PLAN

8.0 POST-CLOSURE PLAN

A post-closure plan is not required at the Honolulu Station. The closure plan is based on the assumption that no hazardous wastes or hazardous waste residue will be left in place within the sumps at the Honolulu Station. If, during closure, the results of the sampling and analysis program indicate that the sump contents and concrete are hazardous, a revised closure plan and post-closure plan will be submitted to EPA for approval.

ATTACHMENT A

WASTEWATER TREATMENT SYSTEM

DESCRIPTION OF EXISTING SYSTEM

The existing wastewater treatment system consists of two 32,000 gallon steel tanks (Tanks No. 5 and 7), a large concrete basin divided into four holding sumps, transfer and recirculation pumps, a chemical feed system, and various instrumentation. Wastewater from the plant is collected and pumped to the appropriate tank or sump for processing. These wastewater streams include boiler and condenser tubeside cleaning wastewater, demineralizer regeneration wastewater, boiler blowdown waste (Low Volume Waste), and boiler and air heater fireside wash wastewater.

A. Boiler and Condenser Tubeside Cleaning Wastewater

This wastewater is collected from direct connections to the boiler or condenser and drained into a surge tank. The wastewater is pumped to Tank No. 7, located above the concrete sumps. Caustic and flocculant are introduced into the tank to precipitate the dissolved solids. After settling of the solids in the tank, the supernatant is drained into the concrete holding sump No. 2 for further treatment. The settled solids are drained into the concrete holding sump No. 3 for later transport via tank truck to the Kahe Power Plant. Final treatment is completed at Kahe.

B. Demineralizer Regeneration Wastewater

This wastewater stream is pumped to Tank No. 5. The alternating acid and caustic waste streams produced during regeneration of the demineralizer ion exchange resins result in a wastewater that neutralizes itself after a period of recirculation. After neutralization, the wastewater is drained to sump No. 2 for settling of the suspended solids. After settling, the clear supernatant is transferred to sump No. 1 for final pH adjustment and subsequent overboarding into the discharge tunnel. The settled solids are periodically removed and transported to Kahe for disposal.

C. Low Volume Wastewater

Non-hazardous low volume wastewater, which is primarily boiler blowdown, drains from the atmospheric blowoff tanks into the building drain system. The building drain system empties into a concrete sump in the station switchyard. Sump pumps deliver the wastewater to the concrete holding sumps No. 1, 2, or 3. The pH is adjusted prior to overboarding.

D. Fireside Wash Wastewater

This wastewater stream is carried by concrete trenches inside of the plant to concrete catch basins outside of the building. Piping from the catch basins carry the wastewater to the sump

in the switchyard. The sump pumps deliver the water to the concrete holding sump Nos. 2 or 3. During this period, the neutralized demineralizer wastewater is diverted to sump No. 1. The fireside wash wastewater is later pumped to tanker trucks which deliver it to the Kahe Power Plant for final treatment.

E. Overboarding

Concrete holding sump No. 1 is made up of the solids separator compartment and the oil separator compartment. Heavy particles will settle and collect in the bottom of the first compartment and liquids will overflow through a weir to enter the second compartment. In the first compartment, the lighter oils present in the wastewater will float on the surface and will be removed by a conveyor belt skimmer system. A submerged type pH probe is installed in the first compartment to monitor the input wastewater for the purpose of controlling the acid treatment operation. At the bottom of the second compartment, a 10-inch pipeline allows the flow of oil-free water directly into sump No. 4.

Sump No. 4 is where the final wastewater condition is monitored prior to its being overboarded into the discharge tunnel. Another submerged type pH probe, water level switches, and the wastewater recirculation pump and overboard pump are located at this sump.

When the inlet wastewater to sump No. 1 approaches the maximum allowable pH of 9.0, the wastewater recirculation pump and the acid feed pump are turned on manually. The recirculation pump draws suction from sump No. 4 and discharges the water back to the plant wastewater line going into sump No. 1. The acid feed pump will inject acid into the plant wastewater line at a point near the exit nozzle to sump No. 1. Good mixing of acid and wastewater is achieved by the agitating action of the high flow water entry into the sump. When a reduced pH reading of the sump water is monitored, both the recirculation pump and the acid feed pump are shut down.

The wastewater overboard pump operation is controlled by a water level switch and the pH reading in sump No. 4. When high water level is reached and pH is detected to be in the safe range of 6.0 to 9.0, the overboard pump is turned on automatically and its discharge is piped into the circulating water discharge tunnel. A shutoff control valve and an integrating flow meter are installed in the wastewater overboard line. The controlling variable for opening and closing the overboard shutoff control valve is the pH reading in sump No. 4. This pneumatic operated valve can be opened only when the wastewater is within the acceptable safe pH range of 6.0 to 9.0. If the pH should shift out of safe range

during overboarding, the overboard shutoff control valve will trip closed and simultaneously the overboard pump will automatically shut down.

F. Sump Cleaning

Sump cleaning involves the removal of liquid effluents and sludge deposits. Non-hazardous liquid effluents are discharged in compliance with NPDES requirements or are pumped into tanker trucks and hauled to HECO's Kahe plant for final treatment and disposal. Sludge removal involves: a) the use of a high pressure air lance to suspend the sludge matter into a slurry, and b) the pumping of this sludge slurry into tanker trucks for transport to Kahe for treatment and disposal.

Sludge is removed from each sump on an average of once a year.

DESCRIPTION OF NEW SYSTEM
(From HECO Specification Number 8340-CONST-1)

I. PROJECT DESCRIPTION

The present wastewater system will be modified and repaired to allow proper collection, treatment and disposal of all of the plant wastewater streams. These include boiler and condenser tubeside cleaning wastewater, demineralizer regeneration wastewater, boiler blowdown waste (Low Volume Waste), and boiler and air heater fireside wash wastewater.

A. Boiler and Condenser Tubeside Cleaning Wastewater
Treatment is done in the existing 32,000 gallon tank No. 7. Provisions will be made to transfer the supernatant from tank No. 7 to tank No. 5 for further treatment.

B. Demineralizer Regeneration Wastewater
Presently, this wastewater is delivered to the existing 32,000 gallon tank No. 5, where it is neutralized then drained into sump No. 2. Because this tank must now be used for fireside wastewater treatment, a new 12,000 gallon tank will be installed on the operating floor to collect and neutralize the demineralizer waste.

C. Low Volume Waste
The boiler blowdowns and heater, turbine and miscellaneous drains are piped to atmospheric blowoff tanks. The condensate flows from the tanks to the plant floor drains which carry the water to the switchyard sump. The sump pumps are designed to deliver this water to sump No. 1, 2 or 3 for proper treatment, if required, and disposal. A new disposal system consisting of standpipes and pumps will be installed to handle this wastewater stream and keep it separate from the fireside wash.

D. Fireside Wash Wastewater
On Unit 8, during boiler and air heater washing, the wastewater falls to the floor and flows to existing drainage trenches. These trenches carry the wastewater to the existing catch basin outside of the plant. On Unit 9, temporary piping connected to the boiler and air heater wash drain connections carries the wastewater to the catch basin. The catch basin piping, which also collects rainwater runoff, drains into the switchyard sump. The sump pumps deliver the wastewater to sump No. 2 or 3. However, because sump Nos. 2 and 3 do not meet EPA's definition of a tank, they can no longer be used to collect this hazardous waste. Therefore, tank Nos. 5 and 7 will be used to collect and treat fireside wash, and the piping system will be modified accordingly. Provisions will be provided to inject caustic, polymer or acid into the

recirculation line to allow complete treatment if desired. The treated, non-hazardous effluent will be drained into sump No. 2 or 3 for subsequent trucking to Kahe or Waiau.

In addition, new temporary piping must be provided from the boiler and air heater wash drains of Unit 8 to the catch basin to prevent potentially hazardous waste from falling to the floor.

II. SYSTEM OPERATION

The following sections outline the procedure for treatment of each of the wastewater streams.

A. Boiler and Condenser Tubeside Cleaning Wastewater

1. The tubeside wastewater will be drained into the 1500 gallon surge tank. Transfer Pump No. 5 will deliver the water to tank No. 7.

2. Caustic and flocculant will be introduced into the wastewater, and the solution will be recirculated to precipitate the dissolved solids. The precipitated solids will be allowed to settle in the tank.

3. The supernatant will be transferred to tank No. 5 via the tank No. 7 drain connection located at the manhole. Recirculation Pump No. 2 will deliver the supernatant to tank No. 5. After draining of the supernatant, the settled sludge in tank No. 7 will be drained into sump No. 2 or 3.

4. The supernatant in tank No. 5 will be recirculated and acid will be introduced in order to reduce the pH. The supernatant will then be drained into sump No. 1.

5. Existing automatic controls will recirculate the wastewater between sump Nos. 1 and 4 and introduce acid as necessary to reduce the pH to between 6 and 9.

6. Existing automatic controls will overboard the non-hazardous wastewater as described in Section F below.

B. Demineralizer Regeneration Wastewater

1. The demineralizer regeneration cycle is started manually. Alternating acid and caustic wastewater streams are produced during regeneration. The wastewater will flow by gravity to a 260 gallon surge tank.

Pumps controlled by the level in the surge tank will deliver the water to the new 12,000 gallon storage tank on the operating floor. After the regeneration cycle is complete (about 4 hours), the wastewater in the tank must be recirculated to thoroughly mix the acid and caustic streams thereby neutralizing the wastewater.

2. Because of the limited tank storage capacity, the next regeneration cycle cannot be started while the demineralizer wastewater from the first cycle is being recirculated.

3. The neutralized wastewater will be drained into sump No. 2 for settling of the suspended solids. The pH must be between 2 and 12 prior to draining. The pH is monitored manually and can be adjusted manually through injection ports in the tank.

4. Transfer Pump No. 4 will deliver the supernatant from sump No. 2 to sump No. 1. Existing automatic controls will adjust the pH as described in Section A-5 above.

5. The settled sludge from the bottom of sump No. 2 must be periodically transferred to sump No. 3 for subsequent trucking to Kahe or Waiau.

C. Low Volume Wastewater

1. The low volume wastewater, which is primarily boiler blowdown, will be drained from the atmospheric blowoff tank to a standpipe. A pump controlled by the level in the standpipe will take suction from the standpipe and deliver the wastewater to sump No. 1.

2. Minimal treatment is required for this non-hazardous waste stream. It will be overboarded after pH adjustment.

D. Fireside Wash Wastewater

1. Temporary piping connected to the air heater and boiler fireside wash drains will carry the wash wastewater to a catch basin on the north side of the Plant. The catch basin drain system will carry the wastewater to the sump in the switchyard. Sump pumps will deliver the water to tank Nos. 5 and 7.

2. Caustic will be introduced into the wastewater, which will be recirculated within the 32,000 gallon tanks, to aid in the precipitation of the metal cleaning wastes out of solution. After raising the pH to between 10 and 11.5, the

wastewater will be continuously recirculated within the tank for 4 hours to ensure the precipitation process is carried to completion, thus rendering it non-hazardous. The non-hazardous waste will be drained into sump No. 2 or 3 for subsequent trucking to Kahe or Waiau.

3. The existing flow meter and strainer will be relocated to allow metering of the wastewater volume which will be drained from either tank No. 5 or No. 7 into sump No. 2 or 3, or directly to the trucks.

E. Boiler Draining

After shutdown and cooling of the boiler, the boiler water will be drained into the 1500 gallon surge tank, then pumped to sump No. 1,2 or 3. Little or no treatment is required. The tank and piping must first be flushed to clear out residue from the tubeside cleaning wastewater.

F. Overboarding

The existing normal overboard Pump No. 3 will take suction from sump No. 4, pump the wastewater through the DynaSand filter for final clarification, then discharge into a clean effluent holding tank. A new overboard pump controlled by the level in the holding tank will discharge through an existing displacement meter to the Honolulu Unit 8 and 9 condenser discharge tunnel.

The existing normal overboard pump is controlled by the sump water level and a pH monitor in the sump. A high water level and normal pH reading between 6 and 9 will start the pump. A low sump level or pH readings greater than 9 or less than 6 will stop the pump.

G. Sump Cleaning

Sump cleaning involves the removal of liquid effluents and sludge deposits. Non-hazardous liquid effluents are discharged in compliance with NPDES requirements or are pumped into tanker trucks and hauled to HECO's Kahe plant for final treatment and disposal. Sludge removal involves: a) the use of a high pressure air lance to suspend the sludge matter into a slurry, and b) the pumping of this sludge slurry into tanker trucks for transport to Kahe for treatment and disposal.

Sludge is removed from each sump on an average of once a year.

MITTELHAUSER corporation

ATTACHMENT B

SAMPLING AND ANALYSIS PLAN

ATTACHMENT B

SAMPLING AND ANALYSIS PLAN

INTRODUCTION

Honolulu Generating Station is closing three sumps which have handled potentially hazardous waste. A sampling and analysis program will be performed to characterize the liquid, sludge and, if necessary, concrete in each sump. The results of this program will establish the method of closure and the quantity of material (if any) to be removed.

LIQUID IN THE SUMPS

The surface area of each sump will be divided into half. One grab sample from each half will be taken and analyzed. The two samples will be representative of the sump from which they were taken.

A coliwasa or equivalent will be used to obtain the liquid samples. If the waste is stratified, a sample will be obtained from each layer. The sampling device will be rinsed after each sampling with distilled water, and the rinse water will be placed in the pond.

Each grab sample will be transferred to a sample bottle prepared prior to sampling by the analytical laboratory with the correct preservative per EPA Publication SW-846. Each sample bottle will be labeled with a waterproof marker prior to filling the bottle.

The waste streams discharged to the sumps were potentially hazardous for the characteristics of corrosivity and EP Toxicity for metals. Therefore, these liquid samples will be analyzed for pH and for trace quantities of the following metals: arsenic, barium, cadmium, chromium, lead, selenium, silver and mercury. The methodology and concentration limits for these constituents are shown in Table B-1.

SLUDGE IN THE SUMPS

At each of the sumps, the surface area will be divided into half. A sample of sludge will be obtained from each half of the sump for analysis. The two sludge samples will be representative of each sump. If the waste is stratified, a sample will be obtained from each layer.

The sludge samples will be obtained using a weighted bottle sampler, dipper, coliwasa or equivalent. The sampler will be rinsed with distilled water prior to sampling, and the rinse water and residues will be placed back into the sump.

The containers for each composite sample will be either wide-mouthed glass jars covered with a Teflon-lined screw cap or zip-lock bags. A minimum of 200 grams will be collected for each sample.

Sludge samples will be tested for pH and the EP Toxicity characteristic. The parameters, concentration limits and methodology are shown on Table B-1.

CONCRETE AT THE SUMPS

Samples of the concrete will be taken for analysis only if the liquid or sludge samples are determined to have hazardous metallic concentrations. After all hazardous waste has been removed from the sump, the concrete washed, and the wash water removed, the surface area of the sump will be divided into quadrants and a composite sample will be taken from each quadrant. Samples will be chipped from six random locations in each quadrant (including the walls) using a hammer and chisel. The chips will then be combined to provide one sample for each quadrant. One additional sample of concrete will be obtained from the sump in an area which has not been in contact with the liquid waste. This will establish a background level for metallic concentrations in the concrete.

Each sample of approximately 500 grams will be placed in wide-mouthed glass jars or polyethylene bags (or equivalent).

The concrete samples will be analyzed for the same characteristics as the sludge: EP Toxicity characteristic for metals (arsenic, barium, cadmium, chromium, lead, selenium, silver and mercury) and for pH. The results of these analyses will allow the Honolulu Generating Station staff to determine if the concrete is contaminated with hazardous waste. The methodology and concentration limits for these constituents are shown on Table B-1.

SAMPLE CONTROL

Each sample container will be labeled with the following information at the time of sampling:

- Sample Number
- Sample Location
- Waste Type
- Date of Sample
- Time of Sample
- Name of Sampler

Seals will be applied to each container immediately after collection to prevent tampering with the samples. The seals will display the following information:

- Sample Number
- Date of Sample
- Collector's Name

One blank sample will be prepared on-site on each day of sampling. The blank will be distilled water transferred to a sample bottle at the site. The samples will be placed in a container and packed in ice. They will then be sent to the laboratory. The Chain of Custody procedures that are described in EPA SW-846 will be followed.

The information pertinent to sampling the liquid, sludge and concrete in the sumps will be recorded in a hard bound log book. Entries in the log book will include the following information:

- Purpose of sampling
- Description of sampling point
- Field contact
- Type of waste sampled
- Description of sampling methodology
- Depth of liquid or sludge at time of sampling
- Depth of sample
- Date and time of collection
- Weather at time of collection
- Field measurements
- Photos, if taken
- Signature of personnel responsible for sampling
- Field observations
- Number and volume of samples
- Sample distribution
- Transportation

TABLE B-1

EXTRACTION PROCEDURE LIMITS AND METHODOLOGY

Constituent	Method[1]	EP Toxicity Limit Milligrams/liter (mg/1)
Arsenic	7060 or 7061	5.0
Barium	7080 or 7081	100.0
Cadmium	7130 or 7131	1.0
Chromium	7190 or 7191	5.0
Lead	7420 or 7421	5.0
Mercury	7470	0.2
Selenium	7740 or 7741	1.0
Silver	7760 or 7761	5.0
pH[2]	9040	-

The method for the Extraction Procedure is 1310 from EPA SW-846.

1. All methods are from EPA SW-846, "Test Methods for Evaluating Solid Waste".
2. pH must be greater than 2.0 and less than 12.5.

ATTACHMENT C

SUMP DIAGRAMS

Attachment C
Removed

Contact Ray Corey
415 974 7966 For Info
Regarding Diagrams

ATTACHMENT D

FINANCIAL ASSURANCE

HAWAIIAN ELECTRIC COMPANY, INC. · PO BOX 2750 · HONOLULU, HI 96840-00

HEI

May 07, 1986

Ms. Judith E. Ayres
Regional Administrator
Environmental Protection Agency
215 Fremont Street
San Francisco, California 94105

Dear Ms. Ayres:

Enclosed is the documentation necessary for Hawaiian Electric Company (HECO) to comply with the annual EPA financial liability requirements for sudden and non-sudden accidental pollution and closure care. The financial test has been used to demonstrate liability for the $10,605,000 annual aggregate.

Provided for compliance is the following:

1) A letter from Hawaiian Electric's Chief Financial Officer and Controller, Mr. Paul Oyer, stating compliance with the liability and closure/post closure requirements enabling Hawaiian Electric Company to demonstrate financial capability.

2) A letter from Peat, Marwick, Mitchell and Company to the Board of Directors of Hawaiian Electric Company stating that the related statements evidenced in the financial test are derived from their independently audited, year-end financial statements, in accordance with generally accepted accounting principles (Exhibit A).

3) A copy of the opinion on Hawaiian Electric Company's consolidated financial statements from our independent certified accountants dated February 11, 1986 (Exhibit B).

4) A copy of Hawaiian Electric Company's consolidated financial statements as of December 31, 1985, opined on by Peat, Marwick, Mitchell, and Company (Exhibit C).

With these submittals, Hawaiian Electric Company will be in compliance with the Environmental Protection Agency's standards applicable to owners and operators of hazardous waste treatment, storage, and disposal facilities to date.

Sincerely,

Susan R. Welch

Susan R. Welch
Director, Insurance & Claims

SRW:JFM:jmm

Enclosures

cc: B. Munger - HECO
D. Fukuda - HECO

HEI

HAWAIIAN ELECTRIC COMPANY, INC. · PO BOX 2750 · HONOLULU, HI 96840-00

Paul A. Oyer
Financial Vice President and Controller

May 08, 1986

Letter from the Chief Financial Officer to Demonstrate Liability Coverage and Assurance of Closure Care

Ms. Judith E. Ayres
Regional Administrator
Environmental Protection Agency
215 Fremont Street
San Francisco, California 94105

Dear Ms. Ayres:

I am the Chief Financial Officer of Hawaiian Electric Company, Inc., P. O. Box 2750, Honolulu, Hawaii 96840-0001. This letter is in support of this firm's use of the financial test to demonstrate financial responsibility for liability coverage and closure and/or post closure care as specified in Subpart H of 40 CFR Parts 264 and 265.

The owner or operator indentified above owns or operates the following facilities for which liability coverage is being demonstrated through the financial test specified in Subpart H of 40 CFR Parts 264 and 265.

Facility

HIT 000 610923
Kahe Generating Station (HECO)
P. O. Box 2750
Honolulu, Hawaii 96840-0001

HIT 000 610873
Waiau Generating Station (HECO)
P. O. Box 2750
Honolulu, Hawaii 96840-0001

HID 000 150680
Honolulu Generating Station (HECO)
P. O. Box 2750
Honolulu, Hawaii 96840-0001

1) The owner or operator identified above owns or operates the following facilities for which financial assurance and closure or post closure care is demonstrated through the financial test specified in Subpart H of 40 CFR Parts 264 and 265. The current closure and/or post closure cost estimates covered by the test are shown for each facility:

Facility	1986 Closure Costs
HIT 000 610923 Kahe Generating Station (HECO) P. O. Box 2750 Honolulu, Hawaii 96840-0001	$1,400,000
HIT 000 610873 Waiau Generating Station (HECO) P. O. Box 2750 Honolulu, Hawaii 96840-0001	$1,140,000
HID 000 150680 Honolulu Generating Station (HECO) P. O. Box 2750 Honolulu, Hawaii 96840-0001	$ 65,000

2) The owner or operator identified above guarantees, through the corporate guarantee specified in Subpart H of 40 CFR Parts 264 and 265, the closure and post closure care of the following facilities owned or operated by its subsidiaries. The current cost estimates for the closure or post closure care so guaranteed are shown for each facility: None .

3) In States where EPA is not administering the financial requirements of Subpart H of 40 CFR Parts 264 or 265, this owner or operator is demonstrating financial assurance for the closure or post closure care of the following facilities through the use of a test equivalent or substantially equivalent to the financial test specified in Subpart H of 40 CFR Parts 264 and 265. The current closure and/or post closure cost estimates covered by such a test are shown for each facility: None .

4) The owner or operator identified above owns or operates the following hazardous waste management facilities for which financial assurance for closure or, if a disposal facility, post closure care is not demonstrated either to EPA or a State through the financial test or any other financial assurance mechanism specified in Subpart H of 40 CFR Parts 264 and 265 or equivalent or substantially equivalent State mechanisms. The current closure and/or post closure cost estimates not covered by such financial assurance are shown for each facility: None .

This owner or operator is required to file a Form 10K with the Securities and Exchange Commission (SEC) for the latest fiscal year.

The fiscal year of this firm ends on December 31. The figures for the following items marked with an asterisk are derived from this firm's independently audited, year-end financial statements for the latest completed fiscal year ended December 31, 1985.

PART B. Closure or Post Closure Care and Liability

ALTERNATIVE II

1.	Sum of current closure and post closure cost estimates (total of all cost estimates listed above).	$ 2,605,000
2.	Amount of annual aggregate liability coverage to be demonstrated.	$ 8,000,000
3.	Sum of lines 1 and 2.	$10,605,000
4.	Current bond rating of most recent issuance and name of rating service.	A+ Standard and Poor's Corp.
5.	Date of issuance of bond.	January 13, 1982
6.	Date of maturity of bond.	December 01, 1991

HEI

* 7.	Tangible net worth (if any portion of the closure or post closure cost estimates is included in "total liabilities" or your financial statements you may add that portion to this line).	$251,895,000
* 8.	Total assets in the U. S. (required only if less than 90% of assets are located in the U. S.).	N/A

		YES	NO
9.	Is line 7 at least $10 million?	X	
10.	Is line 7 at least 6 times line 3?	X	
* 11.	Are at least 90% of firm's assets located in the U. S.? If not, complete line 12.	X	
12.	Is line 8 at least 6 times line 3?	N/A	

I hereby certify that the wording of this letter is identical to the wording specified in 40 CFR 264.151 (g) as such regulations were constituted on the date shown immediately above.

Paul Oyer
Financial Vice President
and Controller
May 08, 1986

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EXHIBIT A

Peat, Marwick, Mitchell & Co.
Certified Public Accountants
Financial Plaza Of The Pacific
P.O. Box 4150
Honolulu, Hawaii 96813
808-531-7286

May 8, 1986

The Board of Directors
Hawaiian Electric Company, Inc.
P. O. Box 2750
Honolulu, Hawaii 96840

Dear Sirs:

We have examined the consolidated balance sheet and consolidated statement of capitalization of Hawaiian Electric Company, Inc. and subsidiaries as of December 31, 1985 and the related consolidated statements of income, retained earnings and sources of funds for construction for the year then ended and have issued our report thereon dated February 11, 1986. Our examination was made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the aforementioned consolidated financial statements present fairly the financial position of Hawaiian Electric Company, Inc. and subsidiaries at December 31, 1985 and the results of their operations and the sources of funds for construction for the year then ended, in conformity with generally accepted accounting principles applied on a consistent basis.

The accompanying letter from the Company specifies certain data as having been derived from the aforementioned financial statements. We have (1) compared the dollar amounts of Common Stock Equity and Other Assets (Intangible Assets) at December 31, 1985 as set forth in the Company's Schedule of Tangible Net Worth to the aforementioned financial statements and found them to be in agreement and (2) recomputed the Tangible Net Worth and found it to be mathematically correct.

Nothing came to our attention as a result of the foregoing procedures that caused us to believe that the specified data should be adjusted. The foregoing procedure does not constitute an examination in accordance with generally accepted auditing standards.

Very truly yours,

Peat, Marwick, Mitchell & Co.

EXHIBIT B

Peat, Marwick, Mitchell & Co.
Certified Public Accountants
Financial Plaza Of The Pacific
P.O. Box 4150
Honolulu, Hawaii 96813

The Board of Directors and Shareholder
Hawaiian Electric Company, Inc.:

We have examined the consolidated balance sheets and consolidated statements of capitalization of Hawaiian Electric Company, Inc. (a wholly owned subsidiary of Hawaiian Electric Industries, Inc.) and subsidiaries as of December 31, 1985, 1984 and 1983 and the related consolidated statements of income and retained earnings and sources of funds for construction for the years then ended. Our examinations were made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the aforementioned consolidated financial statements present fairly the financial position of Hawaiian Electric Company, Inc. and subsidiaries at December 31, 1985, 1984 and 1983, and the results of their operations and changes in their financial position for the years then ended, in conformity with generally accepted accounting principles applied on a consistent basis.

Our examinations were made for the purpose of forming an opinion on the consolidated financial statements taken as a whole. The consolidating information is presented for purposes of additional analysis of the consolidated financial statements rather than to present the financial position, results of operations, and changes in financial position of the individual companies. The consolidating information has been subjected to the auditing procedures applied in the examinations of the consolidated financial statements and, in our opinion, is fairly stated in all material respects in relation to the consolidated financial statements taken as a whole.

Peat, Marwick, Mitchell & Co.

February 11, 1986

ATTACHMENT E

BASIS FOR NOT MONITORING GROUNDWATER

Hawaiian Electric Company based the decision not to monitor the groundwater at the Honolulu Power Plant closure site on several factors: one, there has been no indication that leakage has occurred; two, the waste streams treated in the sumps are only occasionally, and then only marginally, hazardous; three, the waste streams had a short residence time in the sumps before treatment rendered them nonhazardous; and, four, any leakage would have been flushed away by the tidal actions in the saline groundwater underlying the site and would be undetectable.

Routine visual inspections by plant personnel indicate that the sumps have maintained their structural integrity and are not leaking. The sumps are an integral part of the power plant foundation. They are constructed of reinforced concrete, with a wall thickness of one foot. The bottom of the sumps is located below sea level in an area which has a water table that is influenced by tidal variations, and there is no concurrent change in the liquid levels in the sumps as the groundwater level oscillates.

Any liquid which could have been released into the environment would not materially affect groundwater quality. The liquid wastes handled in the sumps were considered hazardous

wastes because of pH and metals content. Table 3-1 in Section 3 of the Closure Plan shows that the wastes seldom exceeded the Federal EP Toxicity limits for metals. After neutralization and precipitation of the waste, the liquid portion and sludge were nonhazardous. The precipitated sludge was removed after treatment and was not stored in the sumps for long periods. The Honolulu Harbor has been polluted by several of the industries in the area. The aquifer below the power plant is not a usable aquifer. Therefore, it is unlikely that the level of hazardous constituents in the wastes in the sumps would have any influence on groundwater quality in the area.

The sumps are sunk into porous coral material which is below sea level and is constantly being flushed by tidal fluctuations. Any leakage which might have occurred would be dissipated by this flushing action. This location on the edge of a deep water harbor makes development of an adequate groundwater monitoring system nearly impossible.

If, during closure, it is found that there is evidence that the sumps have not maintained their structural integrity and may have in fact leaked, EPA will be notified.